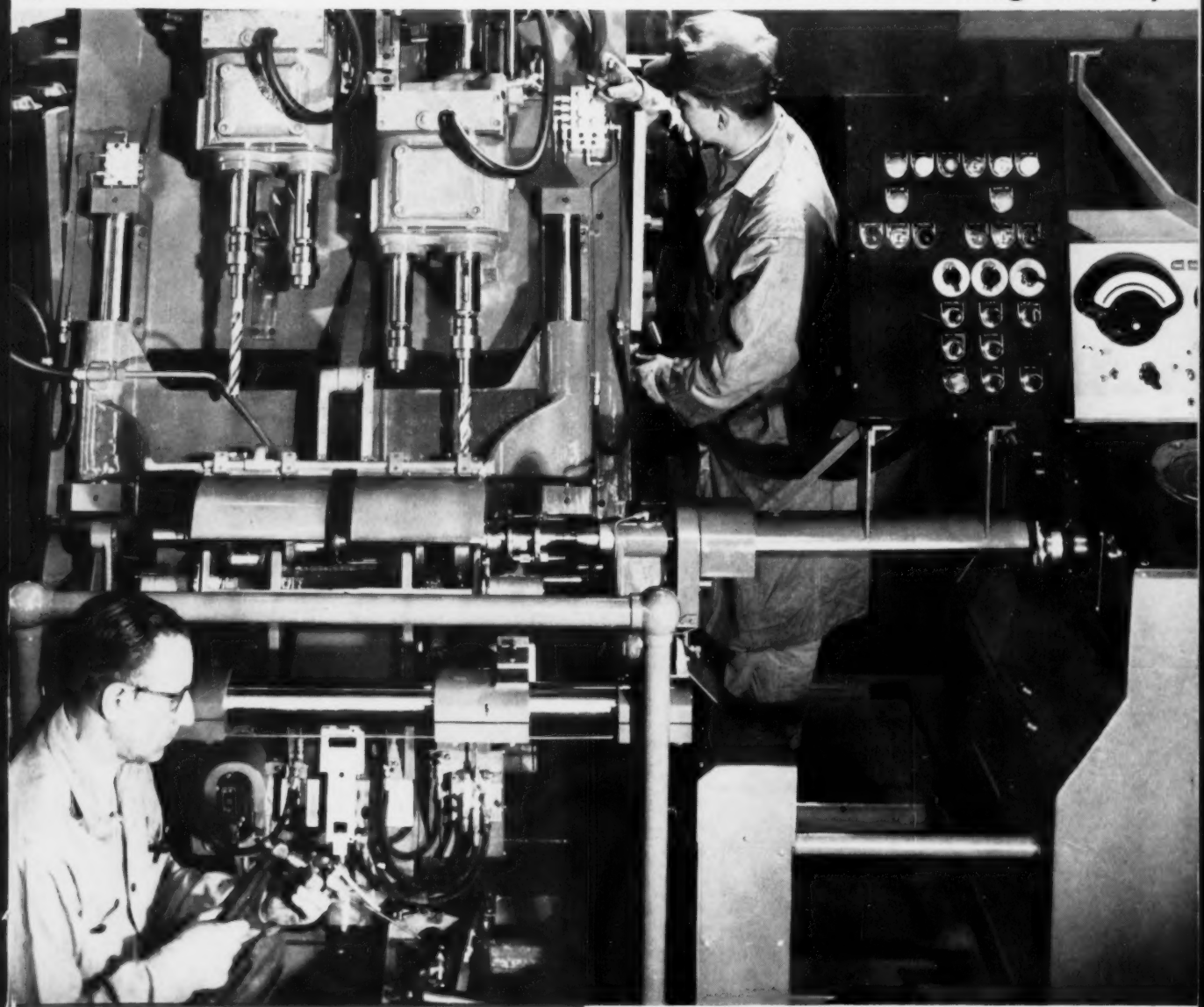
The IRON AGE
April 11, 1957
The National Metalworking Weekly

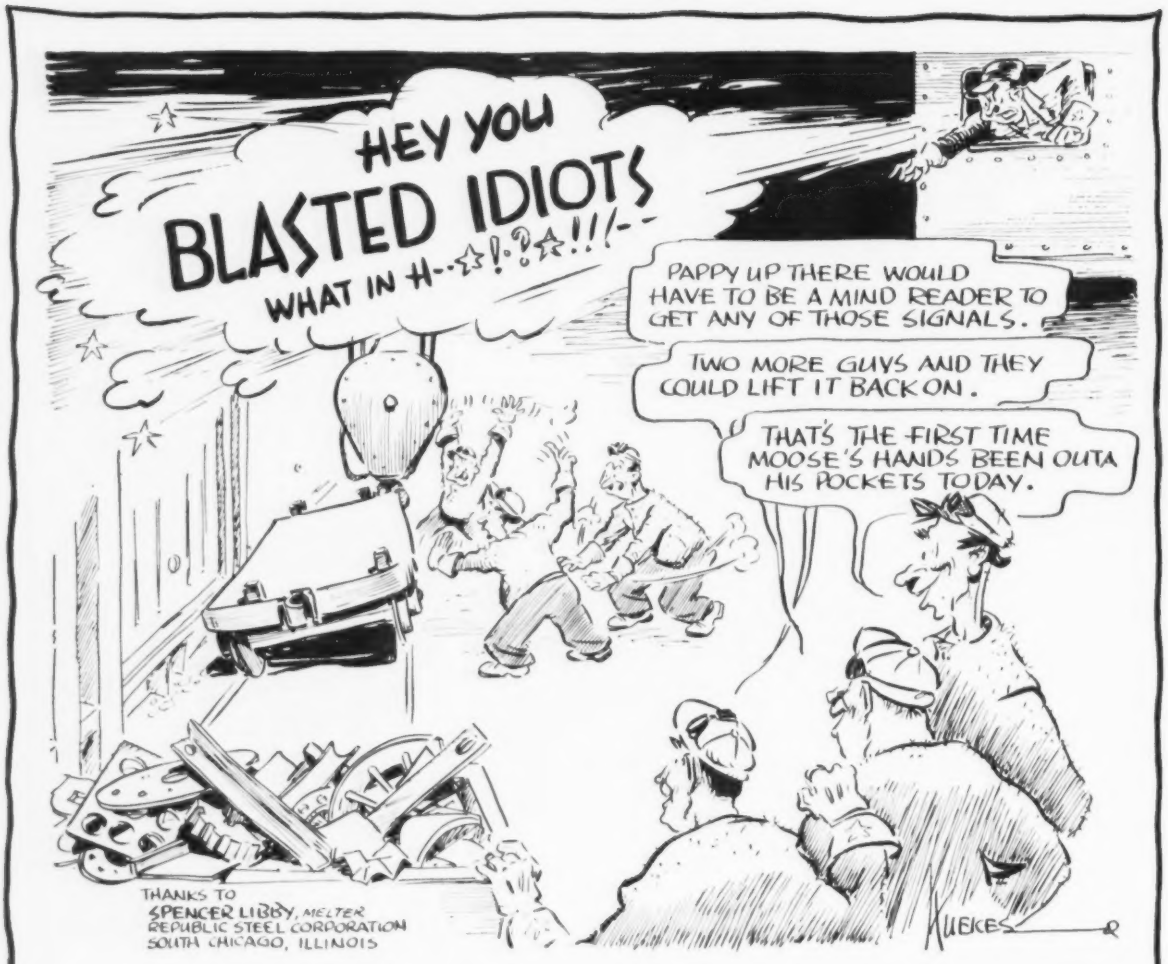


Where You Save With Central Lube Systems P. 111

How Unions Recruit White Collar Workers – P. 71

Three-Factor Plan Simplifies Job Rating – P. 116

Digest of the Week P. 2-3

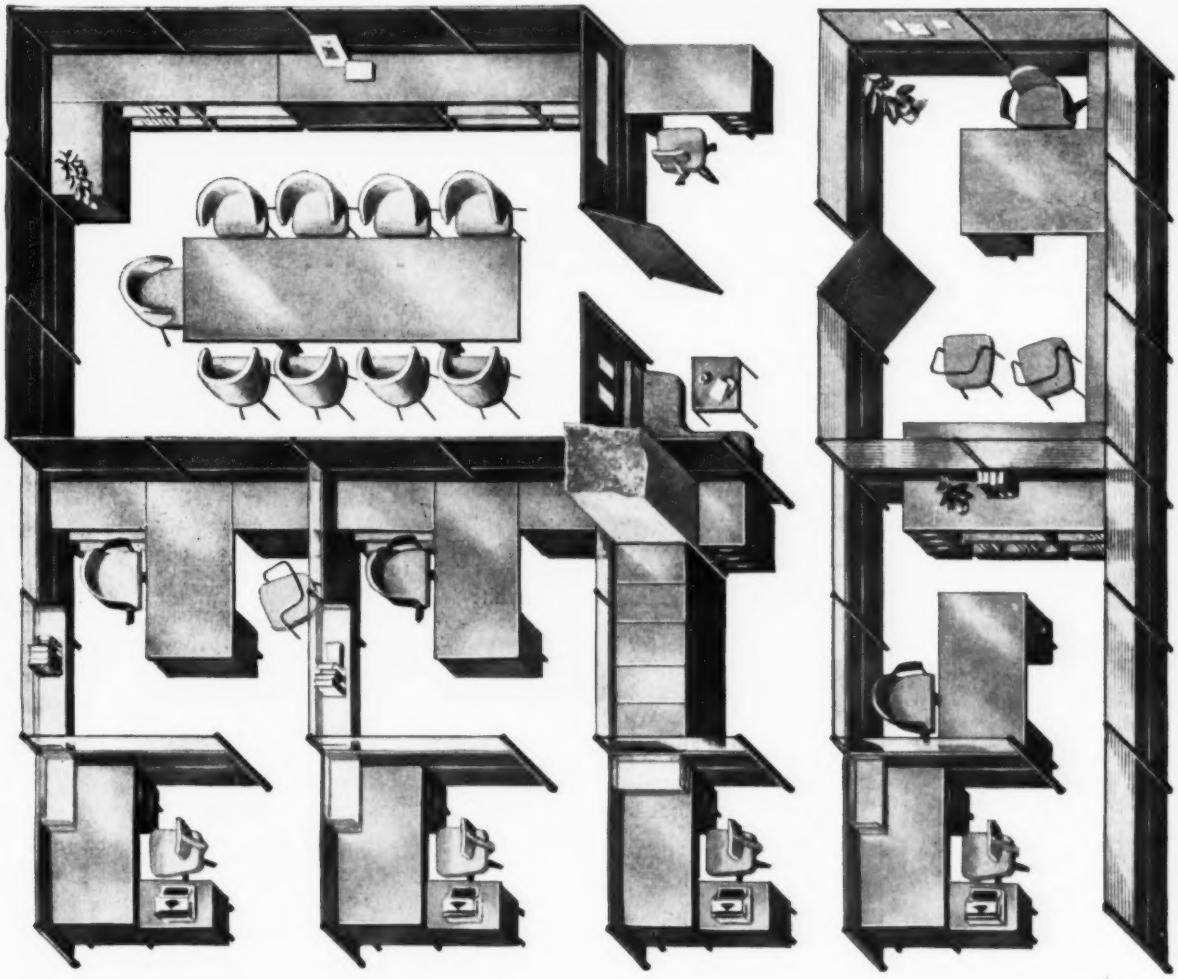

HEY YOU BLASTED IDIOTS WHAT IN H--☆!?☆!!/--
PAPPY UP THERE WOULD HAVE TO BE A MIND READER TO GET ANY OF THOSE SIGNALS.
TWO MORE GUYS AND THEY COULD LIFT IT BACK ON.
THAT'S THE FIRST TIME MOOSE'S HANDS BEEN OUTA HIS POCKETS TODAY.
THANKS TO SPENCER LIBBY, MELTER REPUBLIC STEEL CORPORATION SOUTH CHICAGO, ILLINOIS
KUEKES

The Quarterbacks

WHY NOT DESCRIBE YOUR OPEN-HEARTH CARTOON IDEA AND SEND IT ALONG TO US?

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO



All this in 800 sq ft—with sheet steel

Here, efficiently fitted into a 31 ft by 26 ft space, are individual quarters for an executive and secretary, three supervisors, three stenographers, a file clerk and file room, plus a reception area and spacious conference room! And the whole set-up can easily and quickly be shifted around to meet the changing needs of the tenant.

Such compact and comfortable use of space is possible through the amazing versatility of free-standing sheet-steel partitioning, along with sheet-steel desks and furniture components. And the idea is catching fire: at least one new building has each story planned as one big interior, to be partitioned according to the needs of each individual tenant.

Here is an application that requires thousands of tons of Bethlehem hot-rolled and cold-rolled sheets every year. The actual tonnage figure is growing, too, just as it is for such other latter-day items as room air-conditioners, vending machines, steel fireplaces, TV cabinets and power lawn-mowers—all of them end uses for which our mills at Sparrows Point and Lackawanna are furnishing substantial quantities of hot- and cold-rolled sheets and strip.

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The IRON AGE

April 11, 1957—Vol. 179, No. 15

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NEWS DEVELOPMENTS

Get Set for Union Drive On White Collar Workers

Unions have armed themselves with potent arguments in drive to organize office and technical workers. Management must face up to this and other problems in dealing with unions. **P. 71**

Illness is Costing Industry About $2 Billion a Year

Five-year investigation into illness-absenteeism among workers finds there's no easy solution to the problem. Production lines are hardest hit as absence rate is higher among experienced help. **P. 73**

Signs of Easing Appear In Structural Market

For the first time in two years, there are definite signs of relief for

users of heavy plate and structurals. Demand continues high, but supply is increasing. **P. 74**

Investments Widen Their World

Nonferrous firms very quietly expanded their programs of "diversification by investment" in 1956. Some firms wound up with indirect

Metalworking

OIL SAVINGS: A centralized lubrication system, like the Trabon unit shown, can cut down on oil consumption, machinery repairs, power bills, and accidents. Here is an easy way to check potential benefits in your plant. **P. 111**

interests in competitors. It's made odd corporate bedfellows. **P. 76**

Inland's Steep Rock Mine Gets Ready

Gigantic task of dredging 180 million cu yd of lake bottom to reach ore body is one-third done. Picture story shows Inland Steel's progress to date. **P. 80**

FEATURE ARTICLES

Keep Corrosion at Bay With Chromates

Preventing corrosion on underwater aluminum parts in reactor installations is an absolute must. On this job, chromate conversion coatings play a triple role. They prevent water corrosion, keep galvanic action down, and improve paint adherence. **P. 115**

Three-Factor Plan Simplifies Job Evaluation

If you're rating average jobs with the customary 11 factors, try this new three-factor plan instead. Basic factors are Trade Knowledge, Job Proficiency, and Hazards. It's much faster, more accurate, and simpler. **P. 116**

How Long, How Fast to Heat Tool Steel? (Part II)

More basic pointers on the heating rate of tool steels—especially the effects of shape, furnace atmospheres, circulation, molten media, and steel analysis. Tests show internal structure does not affect heating rate. **P. 118**

In-Plant Plating Line Silvers Wire Faster

Work volume, quality control considerations and cost argued it was time to bring this plating operation in-plant. Fully-automatic system takes four 0.036-in. strands of wire at a time through 12 cleaning, plating, rinse and drying tanks at 20 fpm. Deposit is nickel over thin layer of silver. **P. 122**

How To Troubleshoot a New Shell Molding Line

You'd expect some difficulties with breaking in a new shell-molding line. Shrinking, porosity, run-outs are apt to be troubles, until you get onto it. It took this firm four months to iron out kinks. Here's what they learned. **P. 124**

MARKETS & PRICES

What the Backroom Experts Say in Detroit

One rumor making the rounds in the Motor City is that GM won't have tail fins on 1958 models. There are many more rumors circulating. It helps to know which are based on fact. **P. 88**

Federal Defense Budget Is Tough to Cut

The $40 billion defense budget is a heavy load on the economy. Many congressmen are concerned. But a severe cut would hit almost every business. **P. 93**

Metals Industry Gives Users A Progress Report

Those attending the recent Western Metal Congress and Exposition got a comprehensive look, via talks, panel discussions and exhibits, at what's new and significant in metalworking. **P. 95**

Cutting Tool Advice Is Needed

At the Houston meeting of ASTE, a lot of questions were asked — especially about ceramic and plastic tools. It indicates a better education job should be done by the industry. **P. 97**

Steel Salesmen Are Beating The Bushes

Steel salesmen are wooing the customer with more fervor these days. And they're coming up with some orders. Result: A feeling of restrained optimism for near future. **P. 169**

NEXT WEEK

Why Government Limits Fast Tax Write-Offs

Fast tax amortization now applies strictly to limited, direct-defense items. An exclusive report from Treasury Secretary George M. Humphrey tells why it was cut back and the dangers he sees in a broader program.

ERIE RIGIDROP
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NEW ALL-STEEL GRAVITY DROP HAMMER
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One drop forge shop reports production increases averaging better than 10% with their RIGIDROP. No more waiting time in the handling cycle with Rigidrop's increased forging speed—the direct result of greater piston area per hammer rating, plus Rigidrop's variable stroke control.
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How Armco 17-4 PH Stainless cuts costs, resists galling and corrosion in valve parts

Ruggedness and resistance to corrosion are prime requisites for relief valves that serve boilers and pressure lines in refineries and chemical plants.

Farris Engineering Corp., the manufacturer of this safety valve, uses special Armco 17-4 PH Stainless Steel for the disc and stem retainer . . . the core of the unit. Here's why:

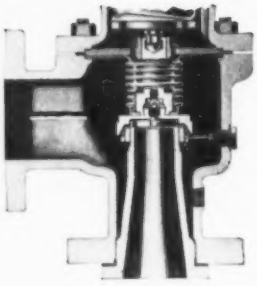
1. Costs are lower because there is no re-machining or grinding after hardening. No distortion occurs during low temperature heat treatment.

2. Parts made of Armco 17-4 PH have high hardness and resistance to galling.

3. Good resistance to impact is provided by this special steel.

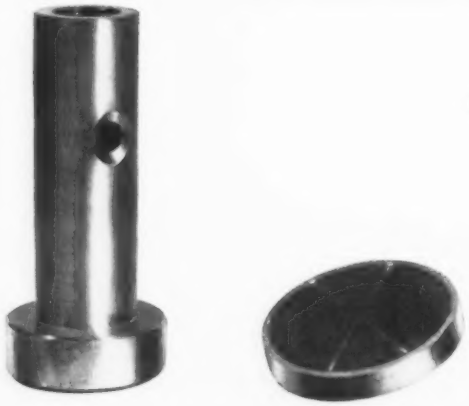
4. Since Armco 17-4 PH has a lower coefficient of expansion than the non-hardenable stainless grade used in adjoining parts, a cause of "hanging" is eliminated.

Stem retainer and disc of Armco 17-4 PH Stainless form the tough "heart" of this relief valve, serving on a pressure line in a chemical processing plant. Both parts shown were finish-machined before hardening because this special steel doesn't distort during heat treatment.



ELIMINATE 4 SHOP OPERATIONS

Finish-machine, then heat treat at low temperature —and a part made of Armco 17-4 PH is ready for assembly. You can eliminate re-machining or grinding, stress relieving, pickling, and straightening operations.



Armco 17-4 PH is available in billets, bars and wire. A companion grade, Armco 17-7 PH Stainless, is produced in sheets, strip, plates, billets, bars and wire. Write us at the address below for full information about these special new precipitation-hardening stainless steels.

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957 CURTIS STREET, MIDDLETOWN, OHIO • SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Long Term Planning You Can't Do Without It

It is time the short-term view had less effect upon the judgement of businessmen. There are too many fish to fry in the long-term picture to become too upset by the immediate outlook.

A case in point is the present. There is considerable confusion about our economy. Many economists see improvement later this year. Others say we are headed for trouble.

But businesses are not living for 1957, 1958 or even 1965. They are trying to gear their actions to a long-term future. Periodic ups and downs, if taken too seriously, could change completely the course most business people want their enterprises to take.

Today a company head must have some kind of a plan. He dare not indulge in economic anarchy. There are many things that cannot be foreseen. But there are major trends that are known, that can be interpreted, and are useful.

We know that the birth rate is going up. It will exceed 4.1 million a year for some time to come. That is a far cry from 2.4 million in 1935; 2.5 in 1940 and 2.9 million in 1945.

Most of us are aware of the basic labor shortage from office boys to presidents. There is no change coming there for many years. The small crop of babies born in the 30's will carry the load of new jobs for some years.

The businessman in Painted Post, N. Y., or in Pueblo, Col.—whether he knows it or not—is affected by what happens in Egypt, in Israel, in Quebec, in Amapa, Brazil or in Florida. He will feel such impacts more in years to come.

That most people would go without meals rather than give up their cars is an interesting economic fact. That teenagers would stay after school rather than lose their telephoning "rights" is significant: and it affects the telephone industry, copper, steel, electronics, plastics, trucks, and labor.

A one-year plan is good. It is an old stand-by. It is often changed at mid-year. Expert advice is often too conservative or too flamboyant but it is better than hit or miss.

A new necessity is a five-year plan—or longer. A course has to be mapped that is not changed too much by short squalls that turn up and then blow away. Such plans need all the management tools available.

You just can't play by ear any more!

Tom Campbell

Editor-in-Chief

A Touch here achieved so much

CHARTING THE WAY TO THE STARS...

A new iridescent point of light flashing through our skies at night will proclaim man's most radical step since the invention of the wheel. The Earth Satellite will be on course, electronically compiling information that will enable man to chart his way to the stars.

The electronic equipment will be housed in a sphere 20 inches in diameter. The sphere will be made in two parts, from a magnesium alloy, deep-drawn after spraying with 'dag'® 41, a colloidal graphite dispersion. A thin film of colloidal graphite covers the pre-heated sheets before insertion in the drawing press.

Final contour is achieved by spraying the hemisphere again with 'dag' 41: then spinning under torch heating and wood tooling until the hemisphere assumes the shape of the spin block. Both hemisphere and spin block are coated with 'dag' 41 to facilitate removal.

'dag' 41 prevents galling, scoring and metal pickup; its ease of application, film strength, lubricity and resistance to heat make it the perfect deep-drawing lubricant. Talk with your Acheson Service Engineer soon, for more detailed information, and write for Bulletin 426—Metalworking Applications. Address Dept. IA-4.

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The Hard Sell

Sir—Your editorial, "There's No Sell Like the Hard Sell," certainly has a punch line to remember—or more precisely, it is an outstanding collection of sales jobs never to be forgotten.

We would appreciate 25 copies for distribution. Our salesmen would approve of your tonic.—**P. J. Wellenberger, Sales Mgr., PIC Design Corp., East Rockaway, N. Y.**

Sir—Mr. Fred Adams, Assistant to the President of this company, has read with considerable interest your editorial "There's No Sell Like the Hard Sell," in the Mar. 21 issue of your fine magazine. May we have your permission to reprint it? —G. Eaton, Ass't Adv. Mgr., Plibrico Co., Chicago, Ill.

■ Permission granted.—Ed.

Executive Health

Sir—We should like to have a dozen copies of "Ten Commandments of Industrial Health" as offered in the Nov. 8, 1956 issue of your magazine if they are available. No doubt the demand for this article has been great and if it is not possible to comply with our request, please send us at least one.

We are hopeful that you will be able to send us 12 copies as your magazine is one of our mediums of advertising and has been for many years a well read magazine among our top personnel. **G. A. Hard, Ajax Electrothermic Corp., Trenton, N. J.**

Air Conveyors

Sir—Will you kindly send me ten copies of the Feb. 14 article "Air Conveyor Breeze Through Tough Handling Chores"?

Many of our customers are inquiring about air conveying new sand and foundry sand and these copies will be used to good advantage. **C. W. Thompson, N. J. Silica Sand Co., Millville, N. J.**

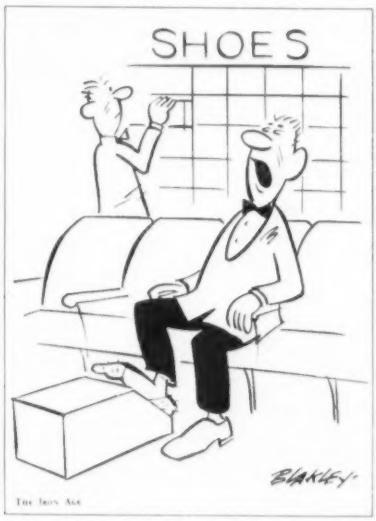
Organic Finishing

Sir—We should like to compliment you on your very excellent article "How To Get More For Your Organic Finishing Dollar." It is of particular interest to us because we handle a line of organic coatings, industrial finishes, etc. Could you possibly let us have thirty copies of this article?

We find it so lucid and to the point that we are certain it will be helpful to our clients. In providing it to them we shall, of course, make certain to mention its origin.—J. W. Eichinger, Eichinger Industrial Sales, Sharon, Pa.

Sir—Congratulations on another excellent article in your special feature series, "How To Get More For Your Organic Finishing Dollar," in your Mar. 21 edition. We would appreciate it if you could forward us six additional copies of this article.—J. T. Marsh, Jr., The Black & Decker Mfg. Co., Towson, Md.

■ Copies are still available.—Ed.



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1/16 STEEL	100,000	UNKNOWN
3/32 STEEL	75,000	UNKNOWN
1/8 STEEL	50,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE NEVER BEEN RUN TO DESTRUCTION

MINIMUM PRODUCTION ON ALUMINUM AND SIMILAR METALS

THICKNESS	MINIMUM	MAXIMUM
1/16 ALUMINUM	125,000	UNKNOWN
3/32 ALUMINUM	100,000	UNKNOWN
1/8 ALUMINUM	75,000	UNKNOWN
5/32 ALUMINUM	50,000	UNKNOWN
3/16 ALUMINUM	40,000	UNKNOWN

MAXIMUM UNKNOWN AS DIES HAVE NEVER BEEN RUN TO DESTRUCTION

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OVER A QUARTER OF A CENTURY OF DIE MAKING SERVICE TO INDUSTRY

FATIGUE CRACKS

Masterpiece

We were feeling pretty cocky about the excellent response the editors had to the Dec. 27 article "How To Simplify Engineering Drawings." Requests for reprints were many and the Brooklyn Navy Yard even incorporated the article into their training program.

But then, to show you that good drafting practice is not restricted to our day, we received a 14 x 20 in. reproduction (partly shown in cut below) of an 1889 drawing from Morgan Engineering Co., Alliance, Ohio.

The entire drawing shows the gearing of the old-type, square shaft-driven crane which preceded the modern electric power-driven cranes. It was sent by Russel Aufrance, assistant to Morgan's sales vice president.

He asks us if it isn't a masterpiece of drafting detail. We heartily agree —and are happy to note that Mr. Aufrance says copies are available to those who write him.

New Puzzler

If a hen-and-a-half lay an egg-and-a-half in a day-and-a-half, how long will it take thirteen hens to lay thirteen eggs?

Steel Sillyfications

We've been receiving "Wacky Mottoes" from you, the readers, at a pretty fast clip. And we intend to keeping running them in this column. But this week we were stopped dead in our tracks by a "Wacky Contest" sponsored by N. E. Slavin & Co., stainless steel warehouse in Worcester, Mass.

It's called "Steel Sillyfications" and is purported to be "A Handy Glossary of Industry Verbiage." Here are some examples:

Steel — Mexican moonshiners' machinery.

Deep Drawing—Trying to fill a middle straight.

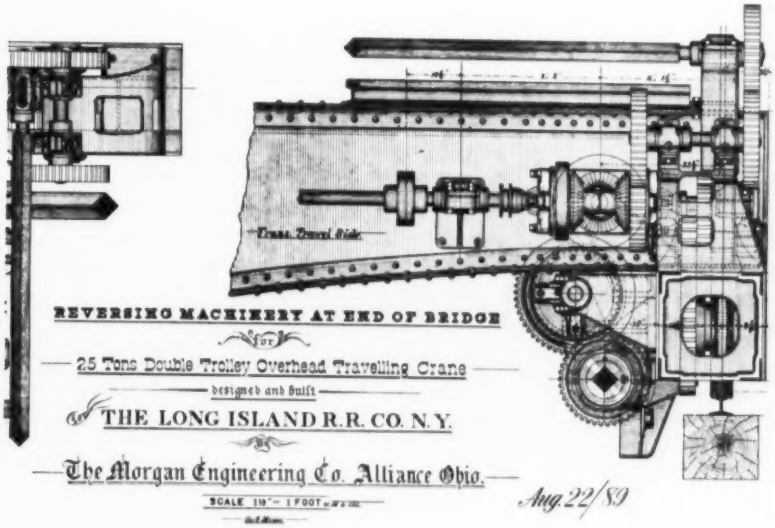
Hex—What George Washington used to chop down that cherry tree.

Bar—Davy-Crockett shot one.

No. 4 Finish—Where what you bet on came in.

Strip Finish—The end justifies the means.

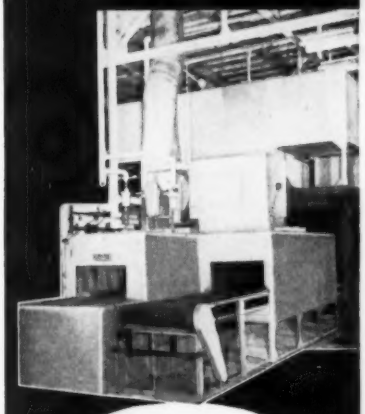
Prizes are being offered by Nat Slavin for the best Sillyfication in the opinion of the judges (Nat Slavin). Here they are: 1) A recommendation to your boss that he give you a free all-expense paid round trip to Europe, or 2) One of Slavin's fabulous jet black, Sterling color trim, mechanical pencils with built-in magnet.


REVERSING MACHINERY AT END OF BRIDGE
25 Tons Double Trolley Overhead Travelling Crane
designed and built
THE LONG ISLAND R.R. CO. N.Y.
The Morgan Engineering Co. Alliance Ohio.
Aug. 22/89

NEEDS:

new design for crucial

metal cleaning and treating



SELECTION:

Cincinnati

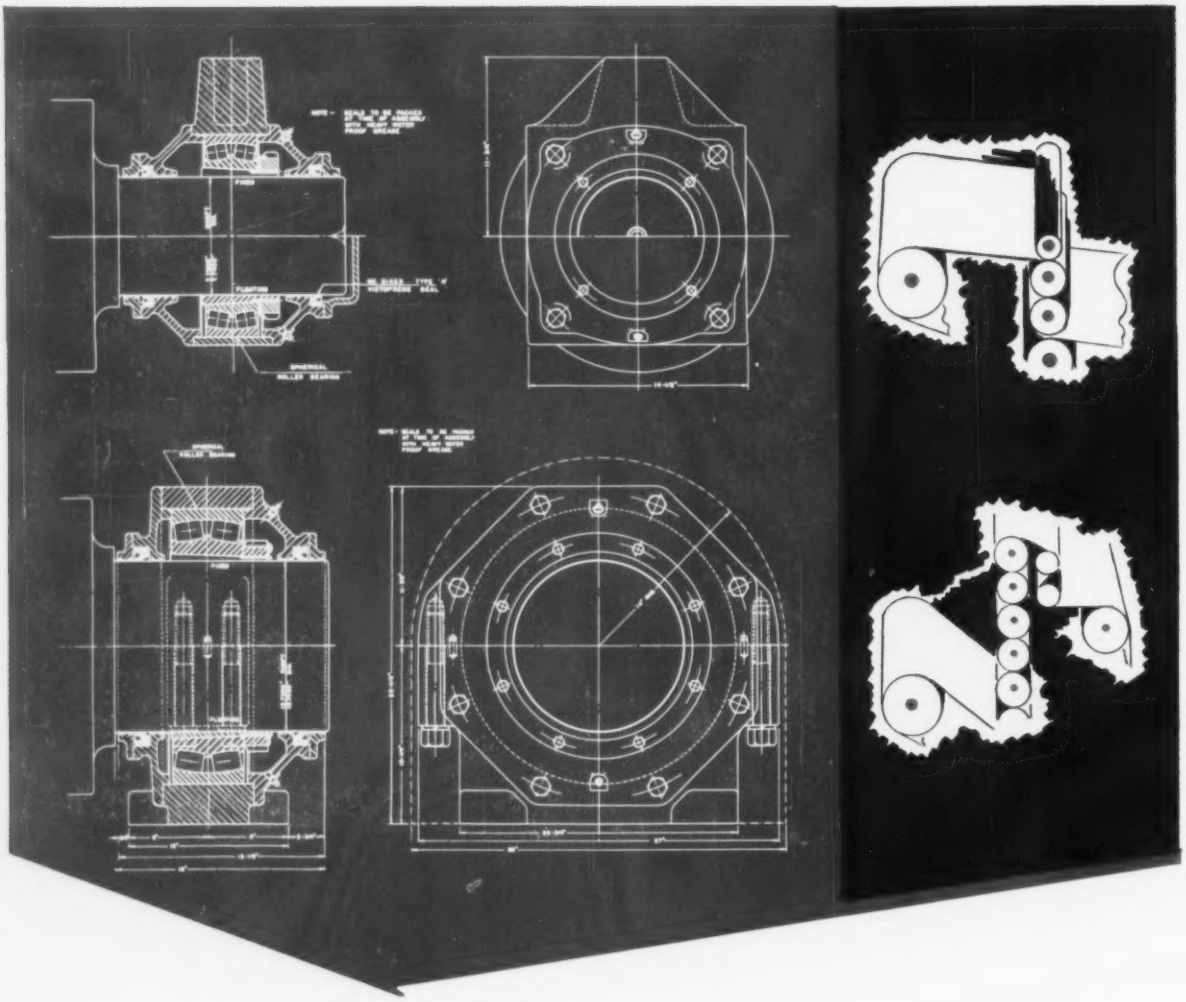
You can't afford to take chances on over 2,345 sq. ft. of metal cleaning equipment. That's why Briggs & Stratton Corp., the world's largest manufacturer of 4-cycle, single cylinder, gasoline engines insisted on CINCINNATI. Ingenious use of suspended, platform-mounted and U-shaped units with transfer conveyors fits all 4 machines into just 765 sq. ft., reduces manpower and maintenance.

You can rely on CINCINNATI experts. Write today for details.

Cincinnati

CLEANING and FINISHING MACHINERY COMPANY

2017 Hageman St., Cincinnati 41, Ohio



a Bearings, Inc. engineered change-over with a built-in plus!

One of our paper mill customers was getting varying caliper readings from center to roll end as the paper came through his calenders. Our investigation showed water-cooled plain bearings were causing a variation in roll diameter from roll end to center.

Our solution was to replace this installation with large bore spherical roller bearings, tapered sleeve mounted with cast housings designed by our Bearing Engineers.

The result? 100% success! No longer are they troubled by roll diameter variations. The PLUS of less maintenance and elimination of frequent bearing replacement . . . the fact that water cooling was no longer necessary, paid for this change-over within a short time!

This is just one of many examples of our *complete* bearing service to *all* industry. Our ability to solve difficult bearing problems is second only to our service in supplying all types and quantities of replacement bearings from the complete list of nationally known bearings we are authorized to distribute!

Rendering bearing service in the territories adjacent to our branches, listed below.

BEARINGS, INC.

OHIO: Akron • Canton • Cincinnati • Cleveland • Columbus • Dayton • Elyria • Hamilton • Lima • Mansfield • Toledo • Youngstown • Zanesville
INDIANA: Ft. Wayne • Indianapolis • Muncie • Terre Haute
PENNSYLVANIA: Erie • Johnstown • Philadelphia • Pittsburgh • York
WEST VIRGINIA: Charleston • Huntington • Wheeling
NEW JERSEY: Camden • **MARYLAND:** Baltimore
DELAWARE: Wilmington •
Subsidiaries: Balanrol Corp. • Buffalo, N.Y.•
Kentucky Ball and Roller Bearing Co. • Louisville, Ky.

EXHIBITS, MEETINGS

Welding Show—Apr. 8-12, Philadelphia. (American Welding Society, 33 W. 39th St., N. Y.)

Engineered Castings Show — May 6-10, Cincinnati. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.).

Design Engineering Show — May 20-23, New York. (Clapp & Poliak, 341 Madison Ave., N. Y. 17).

Packaging & Handling Show—Oct. 28-31, Atlantic City. (SIPMHE, One Gateway Center, Pittsburgh 22).

Metal Show — Nov. 2-8, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3).

APRIL

American Home Laundry Manufacturers Association — Annual meeting, Apr. 14-17, French Lick Springs, Ind. Association headquarters, 20 N. Wacker Dr., Chicago.

American Society of Lubrication Engineers — Annual meeting, Apr. 15-17, Sheraton-Cadillac Hotel, Detroit. Society headquarters, 84 E. Randolph St., Chicago.

American Society For Testing Materials — Symposium, Apr. 16-18, Morrison Hotel, Chicago. Society headquarters, 1916 Race St., Philadelphia.

American Institute of Electrical Engineers—Biennial conference on electric heating, Apr. 23-24, Commodore Perry Hotel, Toledo, O. Society headquarters, 33 W. 39th St., New York.

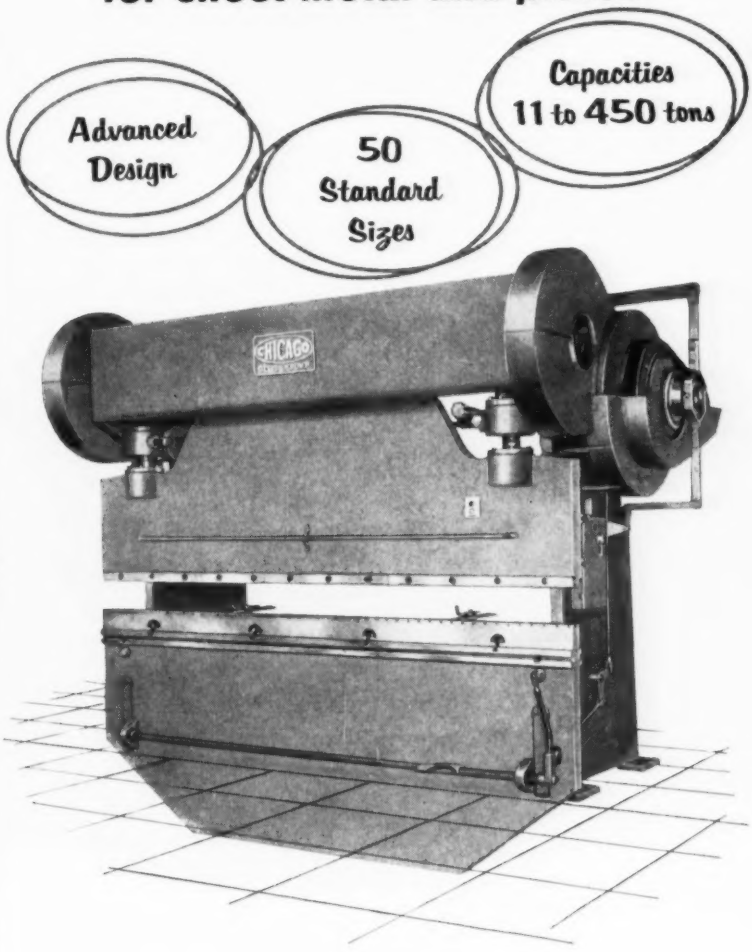
Steel Shipping Containers Institute —Annual meeting, Apr. 23-26, Palm Beach Biltmore Hotel, Palm Beach, Fla. Society headquarters, 600 Fifth Ave., New York.

Copper and Brass Warehouse Assn. —Meeting, Apr. 24-27, Hollywood

Continued on P. 16

CHICAGO® PRESS BRAKES

for sheet metal and plates



This is one of the Series D CHICAGO press brakes. It has a bending capacity of 10 feet by ¼ inch—150 tons. Over-all bending length is 12′-2″.

Complete recommendations for any job on request.

6777

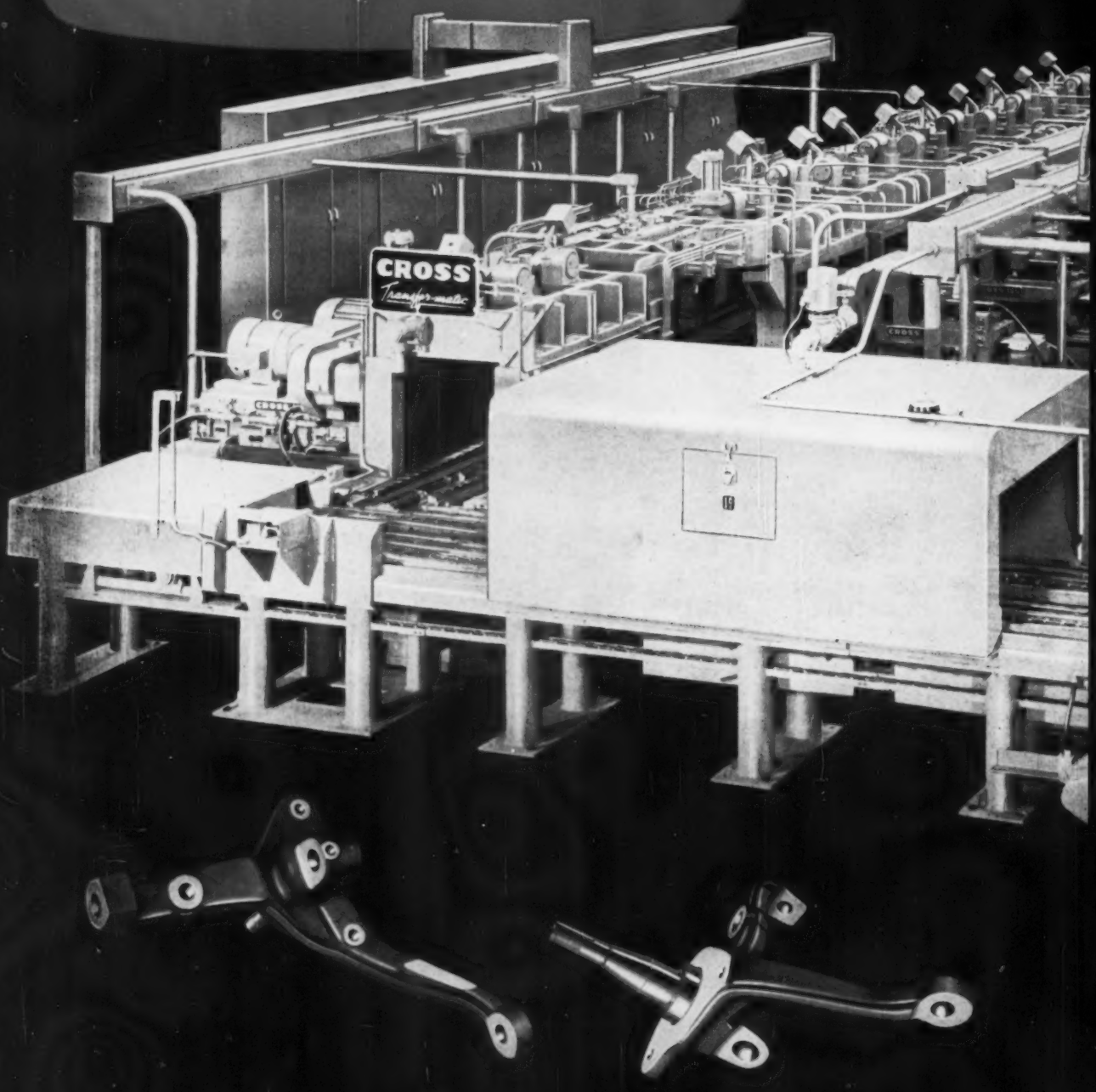
CHICAGO DREIS & KRUMP

Press Brakes • Straight-Side-Type Presses • Press Brake Dies

Hand and Power Bending Brakes • Special Metal-Forming Machines

DREIS & KRUMP
MANUFACTURING CO.
7430 South Loomis Boulevard, Chicago 36, Illinois

Mills, Drills, Reams, Threads Integral Front Wheel Spindle and Steering Arm



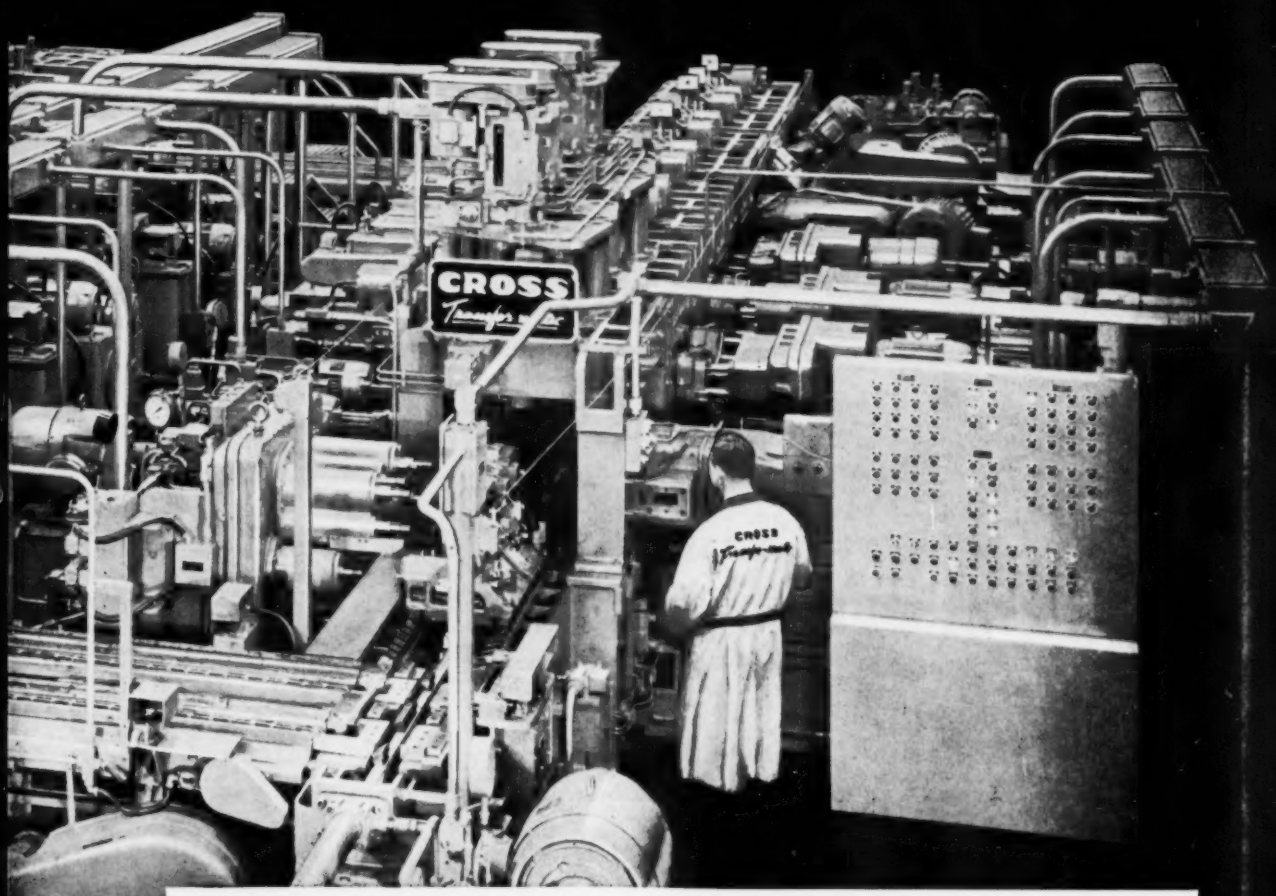
Established 1898

THE CROSS CO.

First in Automation

PARK GROVE STATION • DETROIT 5, MICHIGAN

Another Transfer-matic by Cross



★ Straddle mills upper and lower support arm bosses; straddle mills steering arm boss; mills steering arm stop pad; mills spindle keyway; drills and taper reams upper and lower support arm holes and steering arm hole; drills, reams, chamfers and spotfaces two brake mounting plate holes; drills, counterbores, spotfaces, chamfers and reams brake anchor hole; drills spindle cotter pin hole; and threads wheel spindle.

★ 144 right and 144 left hand parts per hour at 100% efficiency.

★ Pallet type work holding fixtures locate parts from spindle bearing diameters.

★ Power wrench clamps work holding fixtures automatically.

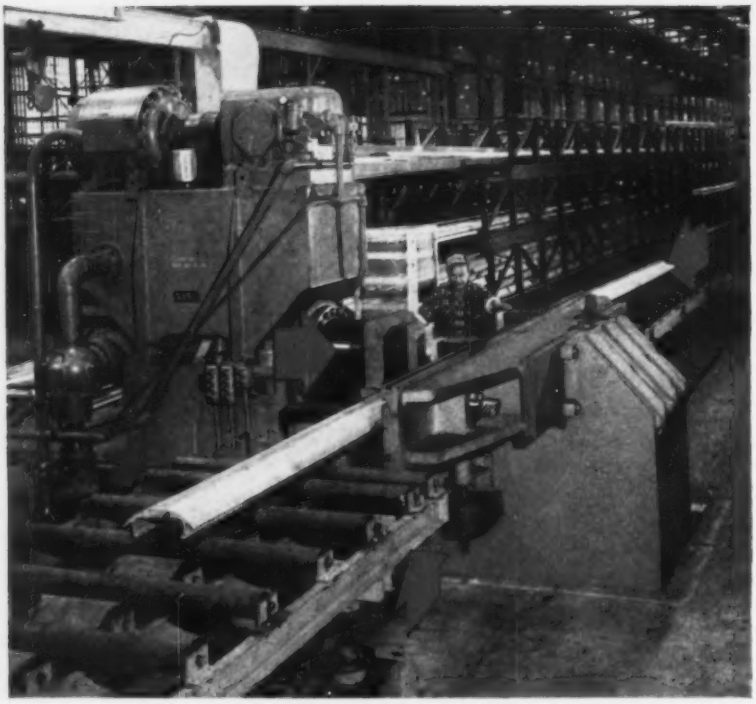
★ Gravity operated cam clamps for the work holding fixtures.

★ Automatic transfer mechanism indexes right and left hand parts through all 17 stations in pairs.

★ Automatic indexing units turn fixtures 82° at Stations 11 and 17.

★ Cross modular unit construction provides flexibility for design changes.

★ Other features: construction to JIC standards; hardened and ground ways; hydraulic feed and rapid traverse for milling, drilling and reaming; individual lead screw feed for threading; automatic fixture cleaning unit; complete interchangeability of all standard and special parts for easy maintenance.



Live-roller conveyor moves work into press. Conveyor moves up or down to position work in die. Ram moves forward to straighten work. Entire installation, including press and conveyor, designed and built by Farquhar.

Kaiser Aluminum uses this Farquhar HORIZONTAL BULLDOZER PRESS for fast-cycle straightening

Aluminum extrusions, fed *continuously* to the press on Farquhar Live-Roller Conveyors, are straightened in a *fast-cycle operation* on this Farquhar 500-ton Horizontal Bulldozer Press. This efficient set-up is installed at the U. S. Air Force Heavy Press plant operated by Kaiser Aluminum & Chemical Corporation in Halethorpe, Maryland. In their own words this press is used "to eliminate natural bows and deformations which develop in some aluminum extrusions after they have been heat treated."

Like Kaiser Aluminum, major plants in this country have found that these Farquhar Horizontal Bulldozer Presses provide high production at low unit cost. Fed either by crane, overhead or in-line conveyors, they are used to economically forge, stamp, straighten or form parts in an efficient, fast-cycle operation.

Write for complete information on Farquhar Horizontal Bulldozer Presses or, better still, ask for our proposals or recommendations.

Farquhar Special Machinery Department . . .

Our qualified staff will build your special machinery economically—your inquiry will receive prompt attention.

A. B. FARQUHAR DIVISION
The Oliver Corporation
Press and Special Machinery Departments
York 26, Pennsylvania

OLIVER

Farquhar **PRESSES**

Also Manufacturers of Farquhar Conveyors

EXHIBITS, MEETINGS

Continued from P. 13

Beach Hotel, Hollywood, Fla. Society headquarters, Investment Bldg., N. W., Washington, D. C.

SAM - ASME — Twelfth annual management engineering conference, Apr. 25-26, Hotel Statler, New York. Society headquarters, 74 Fifth Ave., New York.

American Zinc Institute—Annual meeting, Apr. 25-26, Drake Hotel, Chicago. Society headquarters, 60 E. 42nd St., New York.

Scientific Apparatus Makers Assn.—Annual meeting, Apr. 27-May 2, Greenbrier, White Sulphur Springs, W. Va. Society headquarters, 20 N. Wacker Dr., Chicago.

Assn. of Iron & Steel Engineers—Spring conference, Apr. 29-May 1, Netherland Plaza Hotel, Cincinnati. Society headquarters, 1010 Empire Bldg., Pittsburgh.

Metal Powder Assn. — Annual meeting, Apr. 30-May 1, Drake Hotel, Chicago. Society headquarters, 130 W. 42nd St., New York.

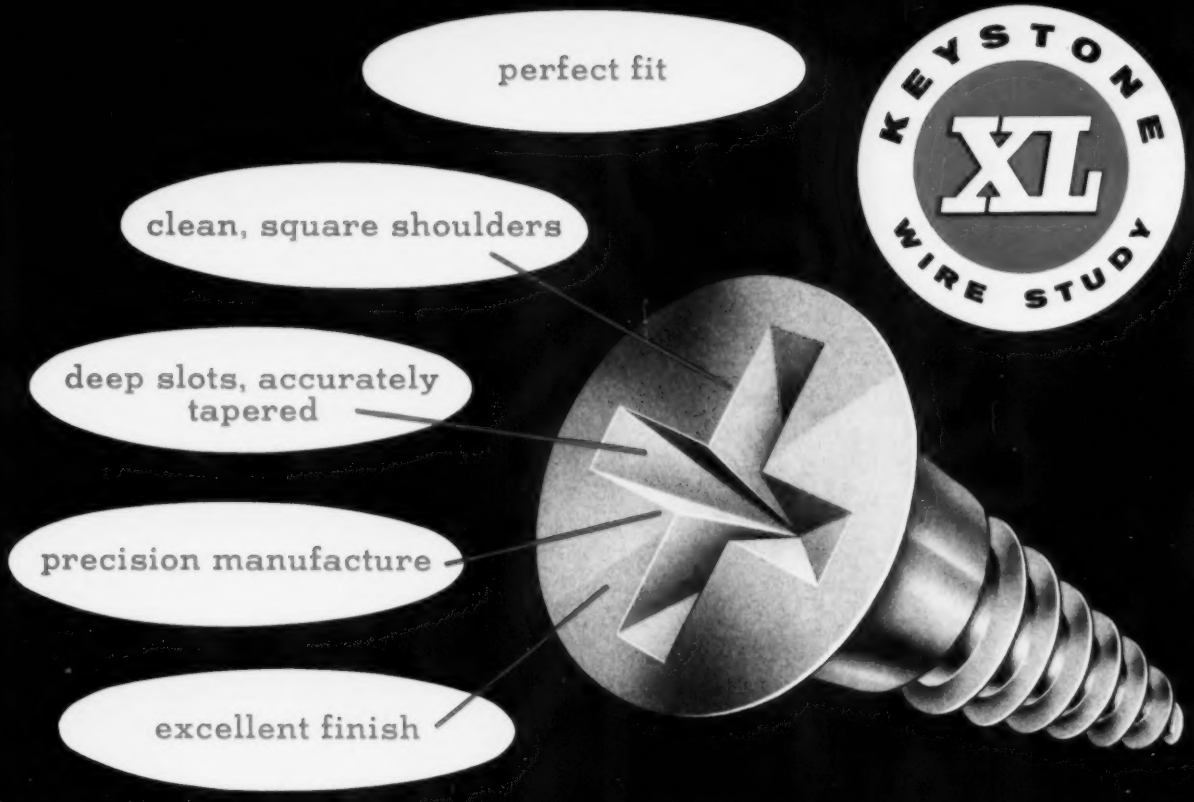
Investment Casting Institute—Annual spring meeting, Apr. 30-May 2, Sheraton Park Hotel, Washington, D. C. Society headquarters, 27 E. Monroe St., Chicago.

MAY

Society For Experimental Stress Analysis — Spring meeting and exhibit, May 1-3, Hotel Statler, Boston. Society headquarters, P. O. Box 168, Cambridge 39, Mass.

National Assn. of Architectural Metal Manufacturers — Nineteenth annual convention, May 7-12, Fairmont Hotel, San Francisco. Society headquarters, 228 N. La Salle St., Chicago.

Copper & Brass Research Assn.—Annual meeting, May 12-15, The Homestead, Hot Springs, Va. Society headquarters, 420 Lexington Ave., New York.



KEYSTONE "XL" *flowability* is the secret for Reed & Prince Mfg. Co., Worcester, Mass.

Reed & Prince Mfg. Company has been producing many complex cold headed parts since 1886. This progressive firm has found that Keystone "XL" Heading Wire successfully fulfills difficult cold upsetting requirements with substantial savings in time and costs, with longer die life and fewer rejects.

Result: They make longer runs of quality fasteners, like the specially designed Reed & Prince Recessed Head Screw shown above, at lowest possible costs. The flowability of the wire is a prime factor in the manufacture of this precision recessed head screw. Deep, accurately tapered slots with clean, square shoulders provide a perfect fit for the Reed & Prince driver. The surface finish of Keystone "XL" Wire assures excellent plating qualities.

Take a tip from Reed & Prince: If you are having trouble heading complicated parts, talk it over with your Keystone representative. He will gladly help you analyze your wire needs. And if you are presently machining many complex parts, it may pay you to discuss your requirements with a manufacturer of cold headed products. We will gladly give you the names of Keystone "XL" Heading Wire users.

Keystone Steel & Wire Company, Peoria 7, Illinois

KEYSTONE
WIRE FOR INDUSTRY

Brand New...
COLD HEADING FACTS FOLDER
. . . send coupon today!

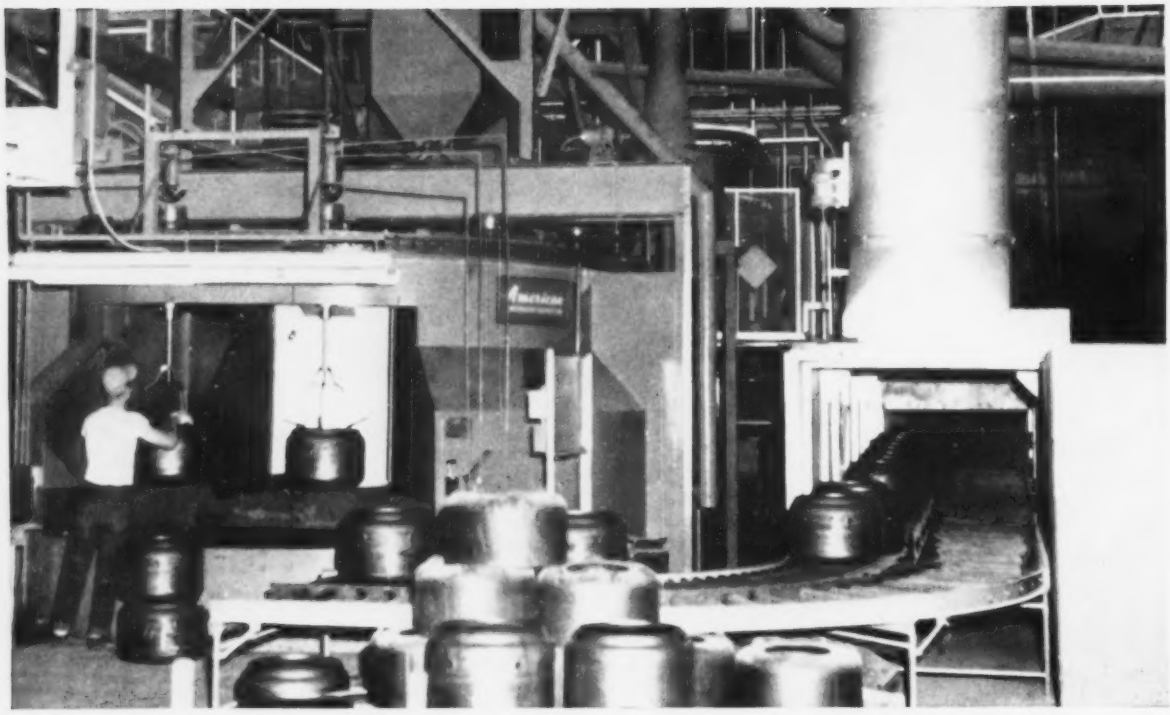
New folder discusses uses, applications, methods, technical facts, wire requirements.

Name_____ Title_____

Company_____

Street_____

City_____ State_____



WHEELABRATOR® Provides 3-Fold Benefits for MAYTAG Porcelain Enameling

Expanded production has brought many innovations to Maytag porcelain enameling operations, including use of Wheelabrator airless abrasive blast cleaning equipment for surface preparation prior to enameling. In combination with burn-off facilities, Wheelabrating replaces pickling of certain components such as washer tubs.

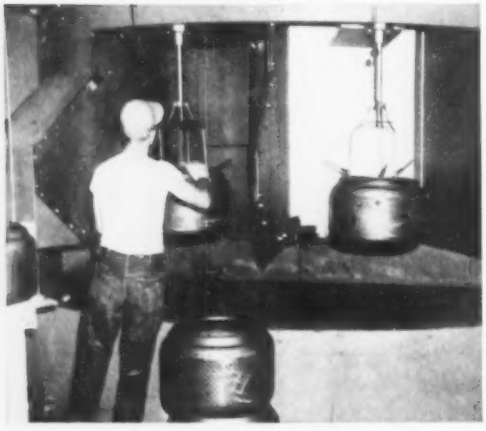
According to Mr. Robert Thompson, Supt. of Maytag's Porcelain Enameling Department, Wheelabrator cleaning was installed because:

(1) It answered the need for increased capacity without expanding existing spray pickle machines;

(2) It eliminates the burr removal problem on spinner tubs while providing a satisfactory bonding surface;

(3) It is a step to provide for future installation of the one-coat white application process.

In the enameling of tubs, a burn-off station to remove oil and grease precedes Wheelabrator cleaning. This two-step operation replaces pickling. Approximately 210 tubs are cleaned hourly.

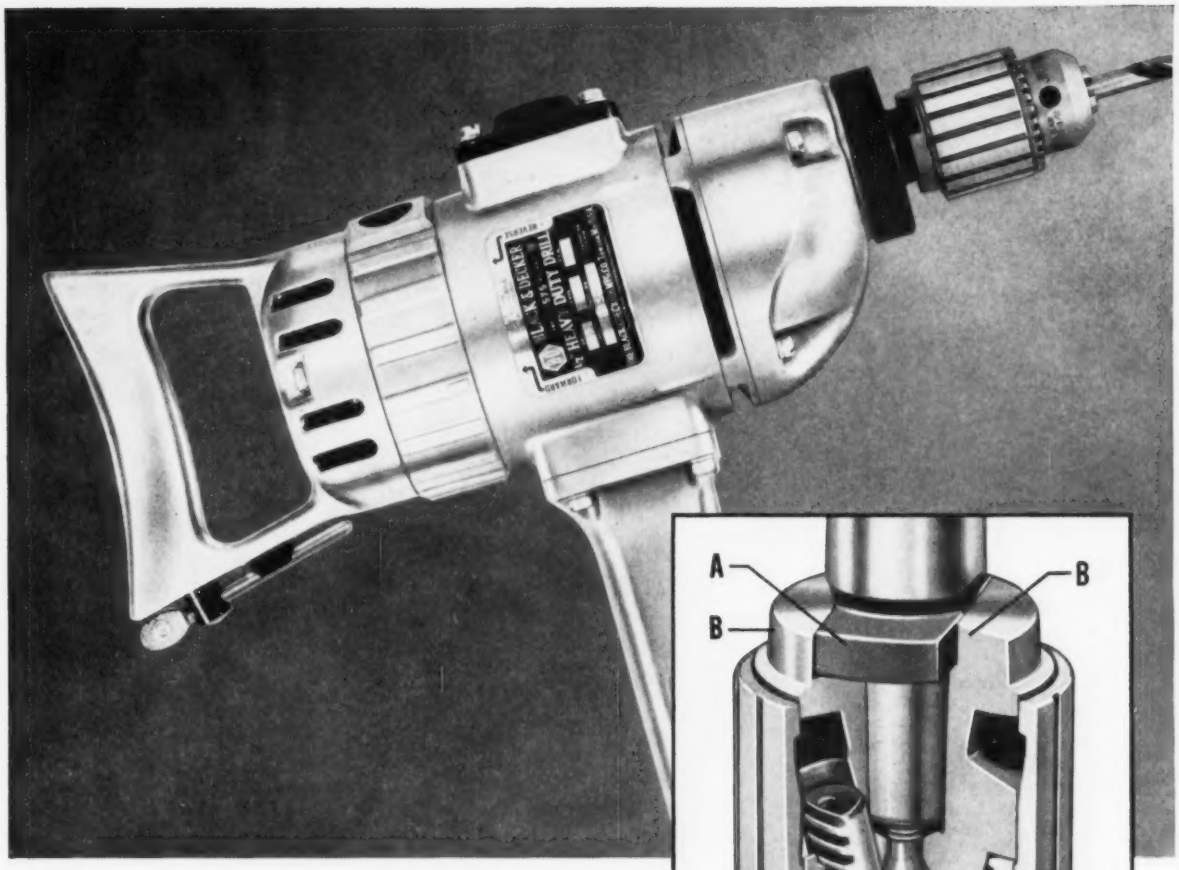


If cleaning steel is your problem or if you are now buying pickled and oiled stock at a premium, Wheelabrator blast cleaning offers tremendous profit possibilities. Write today for complete information on a Wheelabrator for your cleaning problem.

For more details on Wheelabrator cleaning of steel strip or sheet, send today for Bulletin No. 128-D.

WHEELABRATOR
CORPORATION

510 South Byrkit Street **Mishawaka, Indiana**



This new Jacobs chuck delivers the full power of the portable tool in both forward and reverse speeds.

(Featured on Black and Decker's Big New Drills)

The new Jacobs **Model KD** Chuck has a built-in "positive key drive" as an integral part of the chuck body. This "key drive" seats over the rugged driving flange of the drill spindle. The strength of this driver plus the friction of the Jacobs tapers guarantees that the full power of the drill motor is transmitted **through to the work.**

An added safety feature

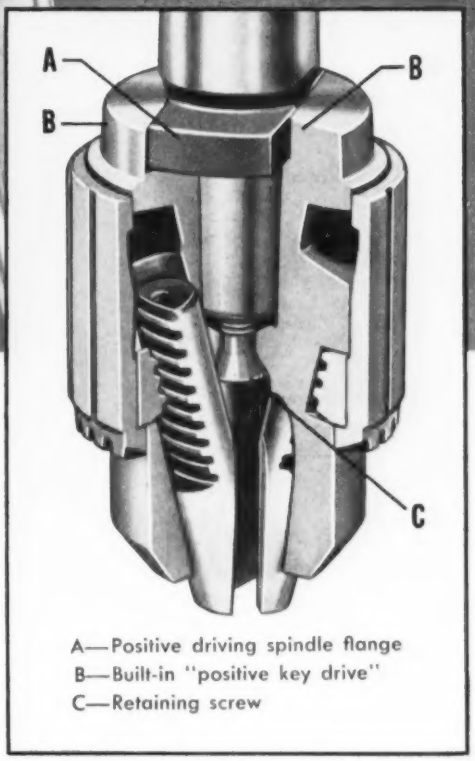
In addition to the positive drive, **Model KD** is locked to the spindle with a retaining screw which prevents separation of chuck and spindle under any conditions.

Ease of chuck removal

The chuck also may easily be removed from its spindle to permit the mounting of other accessories. It may also be easily remounted without loss of accuracy.

Recommended for heavy duty drills

The Jacobs **Model KD** was designed for heavy duty portable drills—electric and pneumatic—especially for reversible types.

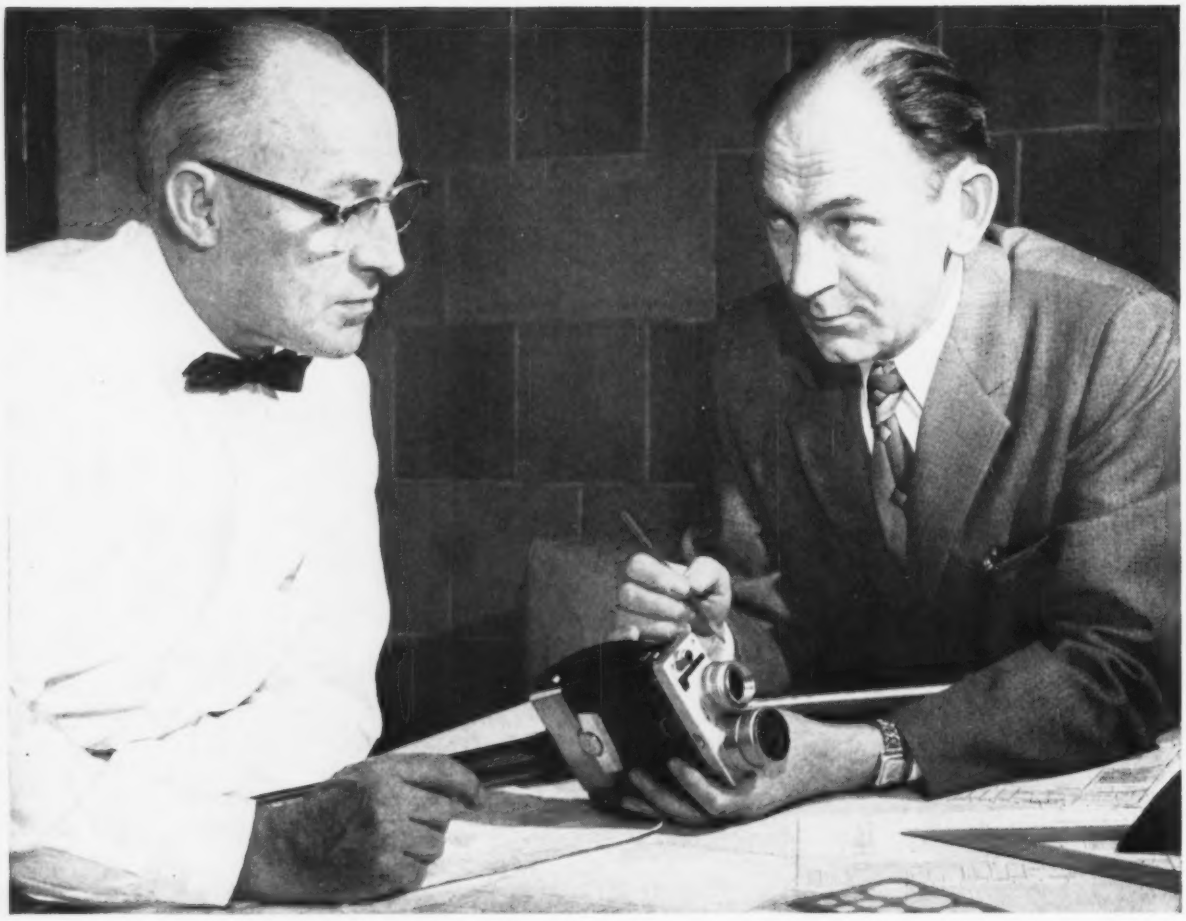


A—Positive driving spindle flange
B—Built-in "positive key drive"
C—Retaining screw

JACOBS AND YOUR INDUSTRIAL SUPPLY DISTRIBUTOR
are ready to deliver the chucks you need and the service you deserve.
first in chucks . . . first in service

Jacobs
CHUCKS

The Jacobs Manufacturing Company
West Hartford, Connecticut



Essential teamwork between design and production departments calls Oscar Riese, left, Superintendent of Metal Parts Manufacturing, into conference with Chief Engineer Paul Richartz, right.

BELL & HOWELL KEEPS COSTS IN SHARP FOCUS AND USES ALCOA SCREW MACHINE STOCK

Competition is toughest at the top. Nobody knows that better than Bell & Howell, world's largest manufacturer of motion picture equipment. On one hand, there's insistence on precision and fine appearance; on the other, emphasis on cost reduction through faster production.

Dilemma? No, because every time Bell & Howell engineers find a new and faster production technique, Alcoa® Aluminum Screw Machine Stock lives up to its end of the job. A classic example is the lens nose for their Wilshire 8 mm camera. The cycle time for drilling, turning, threading, forming, fluting and engraving this part in one complete operation now takes only 1/50 of the period required originally. Even so, surface finish is held to 32 rms, with other tolerances as tight as .001".

Bell & Howell took a long, hard look at every brass part during the shortages in 1951. They weighed aluminum's advantages—corrosion resistance, excellent machinability, light weight, ready availability and the low cost that comes with three times as many parts per pound. As a result, they're designing first for aluminum and using a whopping 300,000 pounds of Alcoa Screw Machine Stock annually.

To the values that prompted Bell & Howell's decision, add electrical and thermal conductivity. If these considerations prompt an analysis of your own requirements in screw machine stock, you'll find a man who can help at your local Alcoa sales office, listed under "Aluminum" in your phone book. Aluminum Company of America, 870-D Alcoa Building, Pittsburgh 19, Pennsylvania.

Bell & Howell Company
finer products through imagination

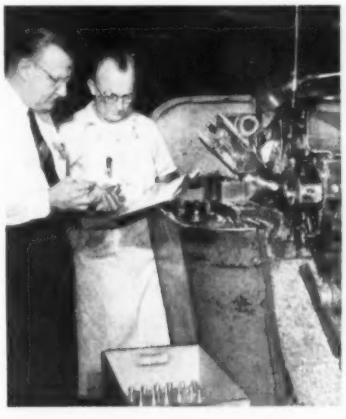
Lens mounts, control knobs, sprockets, film guide rollers and lens caps are among the typical parts machined by Bell & Howell from Alcoa Aluminum Screw Machine Stock.

Purchasing session brings together Chief Metallurgist Arthur Bartmann, left, and Ernest Van Cleave, right, screw machine stock buyer.

IN PURCHASING

"We started with Alcoa and we've always bought from Alcoa. The fact we've never had a reject on their screw machine stock shows that our confidence is well placed. Technical counsel is another advantage. Alcoa helped us assess the relative values of corrosion resistance and machinability to select the alloy best suited to our needs. In the area of deliveries, we've had wonderful cooperation through coordination of shipments with our production schedules. Finally, since heavy stock removal is characteristic of our operations, resale of scrap is an important factor in material cost."

Checking the part (a telephoto lens mount) against the print are John Weber, left, general foreman, and George Sevick, right, operator.



IN ENGINEERING

"Ours is a quality product, depending on a high caliber of precision and appearance for popular appeal. We value aluminum because it lets us design with assurance that the metal will measure up to our requirements and impose no problems in production. We have found that aluminum gives us the high finish and the perfect match from part to part that good appearance demands. We like the versatility that affords us a choice between plating and anodizing. Light weight, achieved with aluminum, is a significant sales point."

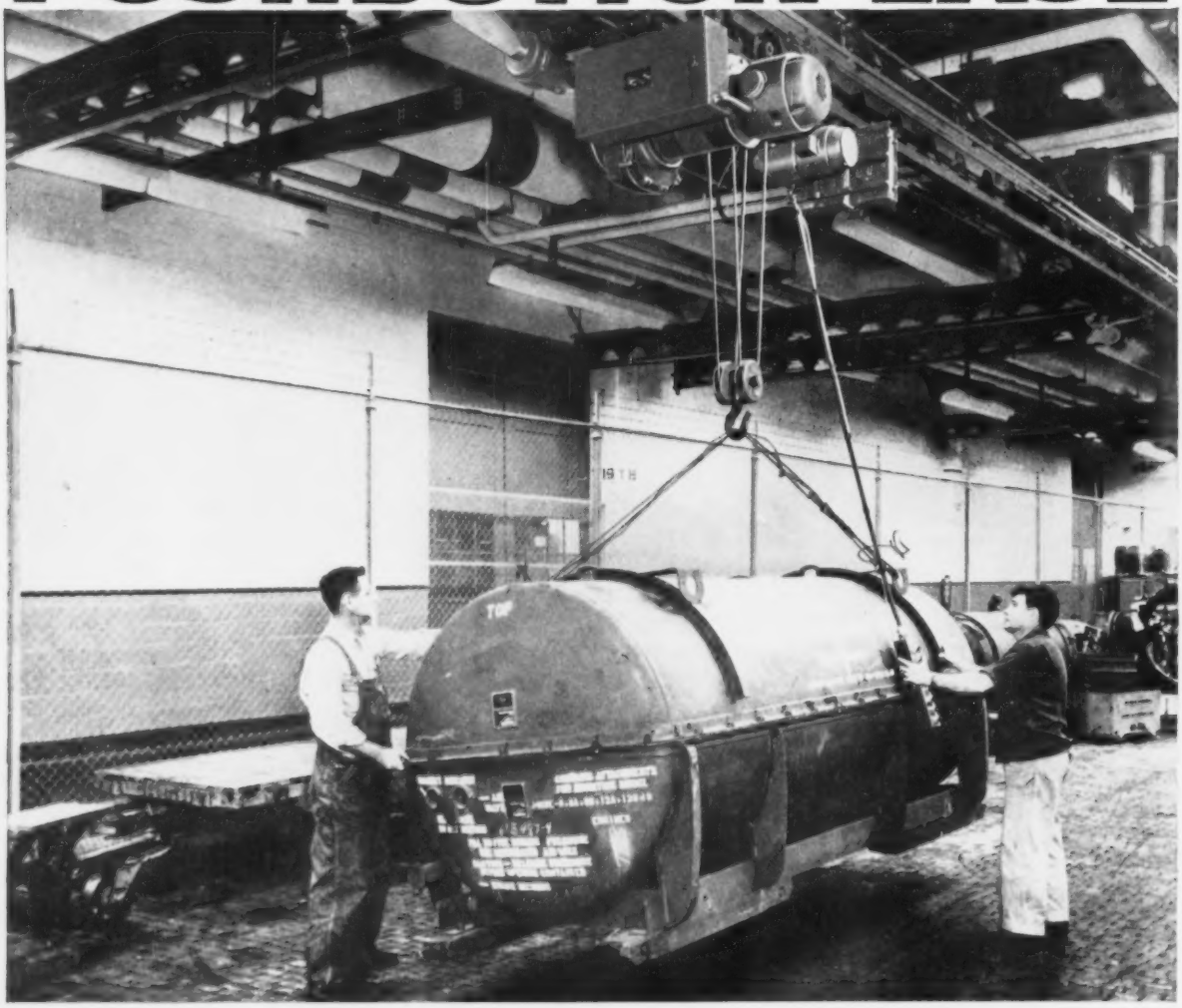
IN PRODUCTION

"Concentricity, depth of flutes, diameter of the bore on this lens mount are typical examples of the close tolerances demanded; .001″ is common. Yet, when we find a way to cut production time on a part from more than four minutes down to 49 seconds, aluminum keeps pace with machining speeds. It doesn't punish the tools, so there's less down time for tool changes. And when we're handling 2″ bar stock, its light weight is mighty welcome."

THE ALCOA HOUR
TELEVISION'S FINEST LIVE DRAMA
ALTERNATE SUNDAY EVENINGS

Your Guide to the Best in Aluminum Value

PUSHBUTTON EASE



EASY OPERATION OF YALE HOIST MEANS SAFE SHIPMENT OF "CANNED" JET ENGINE

Moving "packaged" jet engines to the shipping department is a smooth operation because a Yale Cable King Electric Hoist provides all the power needed for easy, safe lifting and transporting big loads. Push-button controls simplify the operation...give inch-by-inch control during lift and travel...permit accurate spotting and easy guiding of awkward loads. And, Yale's exclusive positive load brake lubrication and unique air-cooling system dissipate brake heat instantly...prevent slowdowns due to overheating. Thus–no matter how heavy the duty cycle–Yale Cable Kings stay on the job!

If your handling operations now include any lifting jobs that are difficult, time-consuming or hazardous, find out how Yale Cable Kings can increase the efficiency and safety factor in your factory or shop. Capacities from ¼ to 15 tons in all types of suspensions. For full facts, contact your local Yale Hoist Distributor (he's listed in the Yellow Pages of your phone book under Hoists) or write The Yale & Towne Manufacturing Company, Philadelphia 15, Pa., Dept. A-944.

YALE* **INDUSTRIAL LIFT TRUCKS AND HOISTS**

*REG U.S. PAT. OFF.

Gasoline, Electric & LP-Gas Industrial Lift Trucks • Worksavers • Warehousers • Hand Trucks • Hand and Electric Hoists

Unsurpassed-anywhere!

IT ALL COMES DOWN to one fact... that you can always count on Roebling high carbon flat spring steel to reduce preparation time, machine stoppages and rejects to a minimum. What's more, it's made as you want it... annealed, hard rolled untempered; scaleless tempered; tempered and polished, blued or strawed.

You *pay* for the best every time you buy flat spring steel. Make sure you *get* it. Specify Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J

California giant Sequoias—largest of all trees.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

ATLANTA, 934 AVON AVE. • BOSTON, 31 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 BEHRINGER-MILLIKIN BLDG., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6, N.Y.

PAGE BY BOEBLING

G-E LAMPS GIVE YOU MORE FOR ALL YOUR LIGHTING DOLLARS

Which General Electric Reflector lamp gives the most light—*and why?*

A THICK coating of tar was smeared on the surface of the right hand lamp where dirt normally collects in use. But in this type of G-E Lamp, it makes no difference. *Both lamps still deliver the same amount of light!*

Why? The important facts are: Dirt just can't get *inside* to the pure silver reflector, sealed in the bulb. Hardly any dirt collects *outside* on the bulb bottom where all the light comes from. That's why light output is practically unaffected by dust and dirt. And since they seldom if ever need cleaning, maintenance costs take a sharp drop.

General Electric *Filament* Reflector Lamps are available in 500-watt, 750-watt and 1000-watt sizes with pure silver reflectors. G-E *Mercury* Reflector Lamps are available in 400-watt (silver or phosphor reflectors), and 1000-watt (phosphor reflector) sizes.

SWITCH TO G-E REFLECTOR LAMPS (Filament or Mercury) YOU'LL GET MORE LIGHT, SAVE ON MAINTENANCE, TOO!

Your General Electric Lamp Representative will be glad to help you pick the best one for your plant. Call him today—or write: General Electric Large Lamp Dept. IA-4, Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC

How A. O. Smith Corporation makes a "Diagonal Tie" with USS GERRARD Round Steel Strapping

This unique diagonal tying method was designed by the Plant Superintendent of the Welding Products Division, A. O. Smith Corporation, Milwaukee, Wisconsin, in cooperation with a USS Gerrard sales representative.

Intricate-looking enough to be nicknamed the "Diagonal Tie," the method is actually very simple and has proved ideal for securing corrugated boxes of welding electrodes. The USS Gerrard Round Steel Strapping not only acts as a perfect closure but reinforces the box so that it will not tear when one end is lifted. In addition to preventing box damage and lost pieces, the "Diagonal Tie" makes a very favorable impression on customers.

The "Diagonal Tie" is made on the Gerrard Model Q Semi-Automatic Machine. A. O. Smith's Welding Products Division has been using USS Gerrard Steel Strapping for over ten years.

You, too, can receive the time- and money-saving advantages that USS Gerrard has to offer. No matter what your packaging-shipping problem is, we'll come up with a practical solution. Contact a USS Gerrard Sales representative for any help you need.

THE DIAGONAL TIE

NEW CATALOG—HOT OFF THE PRESS!

36 pages of photographs, description, facts and figures on all USS GERRARD Steel Strapping and associated equipment.

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CHICAGO, ILLINOIS

USS GERRARD STEEL STRAPPING

Round and Flat

UNITED STATES STEEL

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United States Steel Corporation
4711 South Richmond St., Chicago 32, Ill.

Please send me, free of charge, the new 36-page GERRARD Blue Book of Packaging.

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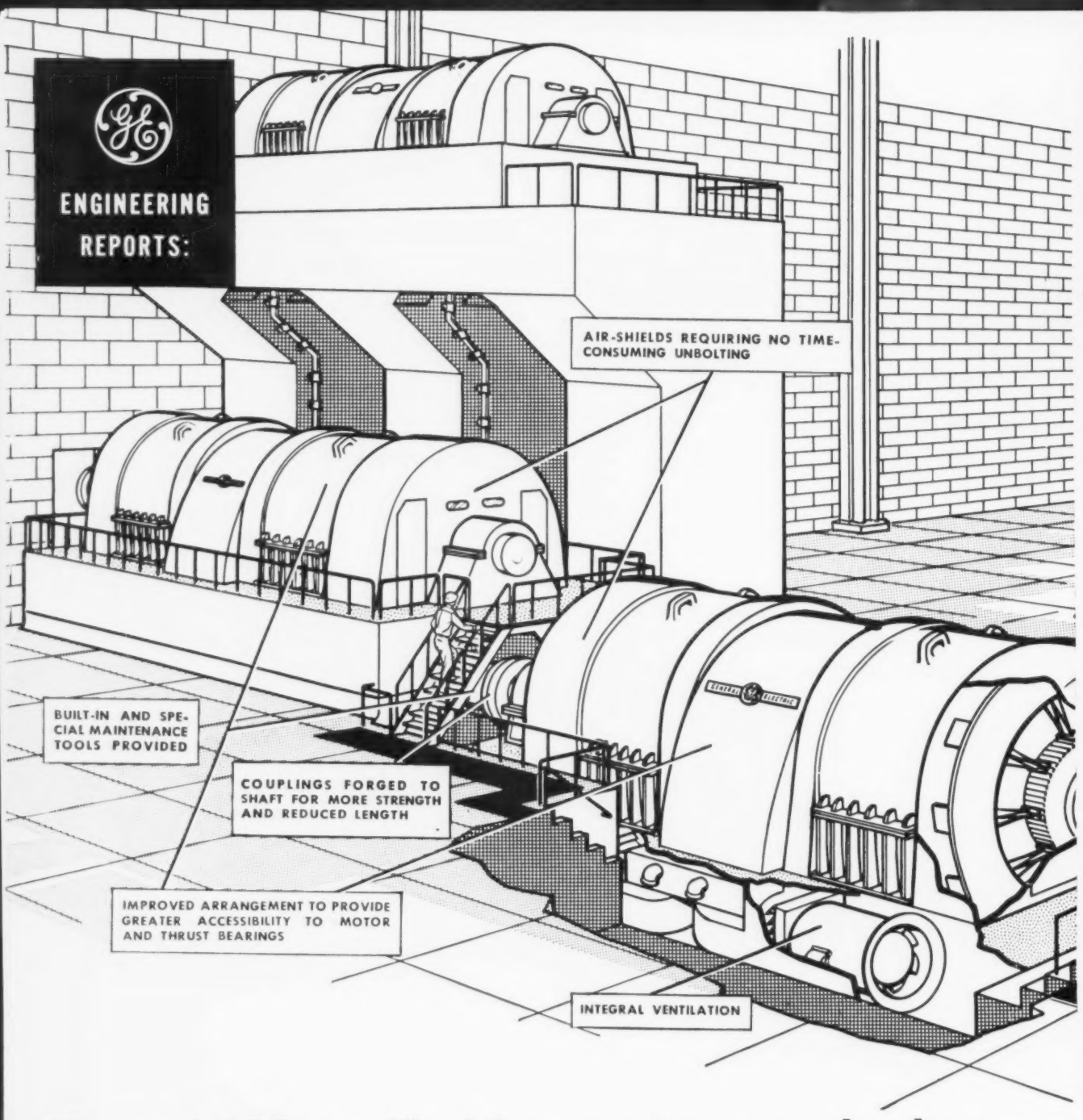
☐ Have Salesman Call
☐ Literature only


ENGINEERING REPORTS:
AIR-SHIELDS REQUIRING NO TIME-CONSUMING UNBOLTING
BUILT-IN AND SPECIAL MAINTENANCE TOOLS PROVIDED
COUPLINGS FORGED TO SHAFT FOR MORE STRENGTH AND REDUCED LENGTH
IMPROVED ARRANGEMENT TO PROVIDE GREATER ACCESSIBILITY TO MOTOR AND THRUST BEARINGS
INTEGRAL VENTILATION

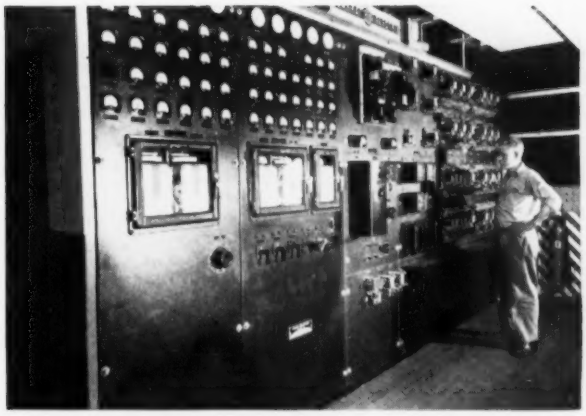
New slabbing-mill drive system emphasizes

General Electric d-c drive system for new slabbing mills will have unique design features

SPIRALING OPERATING COSTS and increasing capital requirements for equipment throughout the steel industry have brought about a restudy of conventional construction practices and maintenance problems. The General Electric Company, recognizing the requirements of this basic and fast growing industry, undertook additional comprehensive studies of system design and drive construction. This was done to simplify and reduce electrical maintenance, and lower initial capital investment, through reduced construction costs.

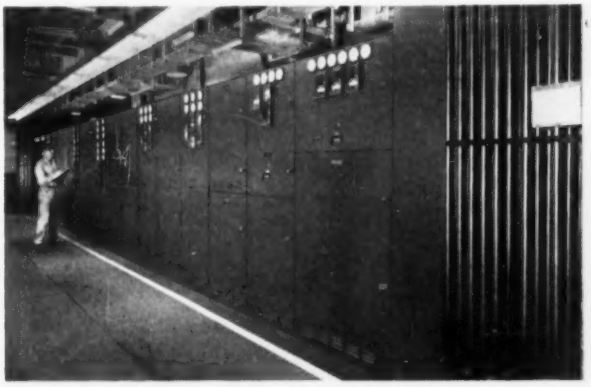
NEWEST HIGHLIGHTS of the design study, as now being furnished on General Electric engineered electrical systems for slabbing mills, are shown above. These unique design features will permit easier "productive maintenance" (by simplifying and reducing maintenance requirements) and minimize production stoppages. Some of the new main-drive design features are:

- **Integral ventilation**
- **Improved twin drive arrangement**
- **Forged flange couplings**
- **Quickly removable air-shields**
- **Built-in and special maintenance tools**

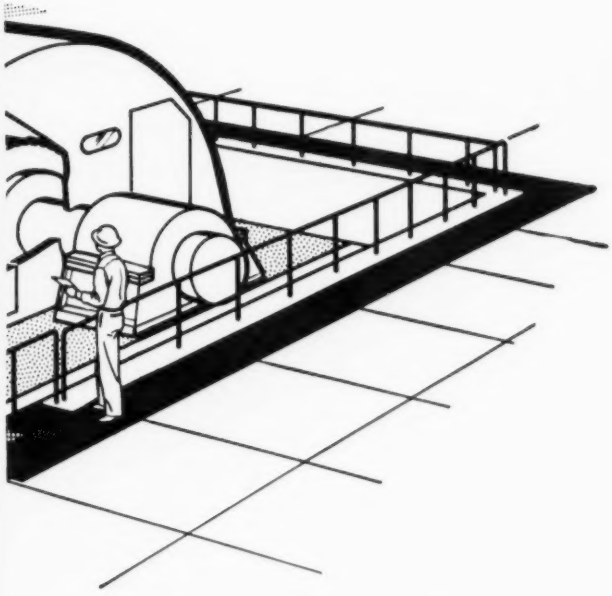


SYSTEM ENGINEERING co-ordinates electrical system by centralizing control functions for mill in master control panel. Instrument panel provides production picture at a glance.

ENCLOSED General Electric flywheel, induction-motor-generator set provides direct current for the huge slabbing-mill drive motors with minimum load swing on power system of the mill.



INCOMING POWER is distributed through General Electric double-ended unit substation. Magne-blast power circuit breakers provide excellent service entrance and feeder protection.

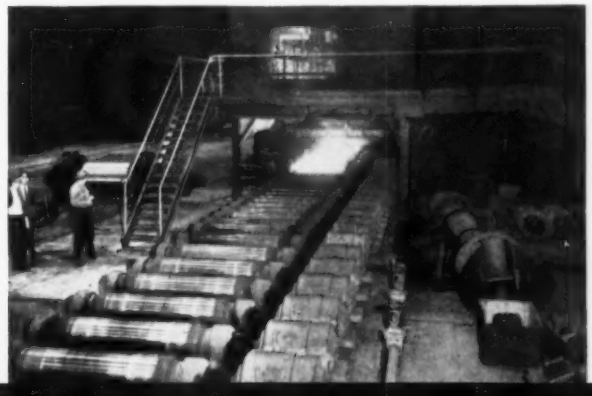


LOWER INSTALLATION COSTS are possible with unit substation arrangement of G-E pumpless rectifiers. Pumpless stainless steel tanks, twin ignitors (1 spare) mean more dependable service.

reduced maintenance

The General Electric Company is proud of its electrical systems contributions to the steel industry and is ready to place complete engineering services and quality-engineered electrical equipment at your disposal. Your nearest General Electric Apparatus Sales Office will give you complete information. General Electric Co., Schenectady 5, New York. 659-114

ELIMINATING reduction and bevel gears and lineshaft, this application of General Electric MD-600, direct-current mill auxiliary motors minimizes maintenance.



Engineered Electrical Systems for Steel Mills

GENERAL ELECTRIC

THE *IMPACT* STORY BEHIND THE PICTURES-

Four impact blows on three Cecostamps formed and blanked an aircraft instrument panel—ready for use!

FORMING—Pre-cut ⅛" aluminum stock was formed on two Cecostamps. The two pre-forming stages were worked simultaneously on one Cecostamp with one impact blow. The second Cecostamp did the final forming and setting in one impact blow. Note 90° flanges and 1½" step across center. No further trimming required.

BLANKING—Single impact blow of third Cecostamp accomplishes blanking of instrument holes. Bottom blanking die is made of zinc alloy using ½" thick chrome alloy plate backed by rubber in hole openings to eject slugs. Upper die has ⅜" chrome alloy punches. Rubber, cemented around perimeter strips panel from die. Only ⅛" landing between some of the holes —and approximately 225 lineal inches are sheared!

This job is a unique Cecostamp achievement!

JOBS LIKE THIS PROVE THE VALUE OF THE *IMPACT* OF A

CECOSTAMP

The Cecostamp's controlled *impact* blow forms and sets the metal to exact dimensions. Add to this important feature Cecostamp's flexibility for handling a complexity of forms, its simplicity of tooling, its low operating cost and safety features and you will appreciate why Cecostamp is the modern forming tool for today's and tomorrow's metal shop requirements. The Cecostamp incorporates easier operation and greater strength and power, in anticipation of the tougher alloys of heavier sections and larger units which are more and more in demand. You'll want to consider the Cecostamp for your shop.

Send for Bulletin 30-L-5.

SOME OF THE ADVANTAGES OF THE CECOSTAMP

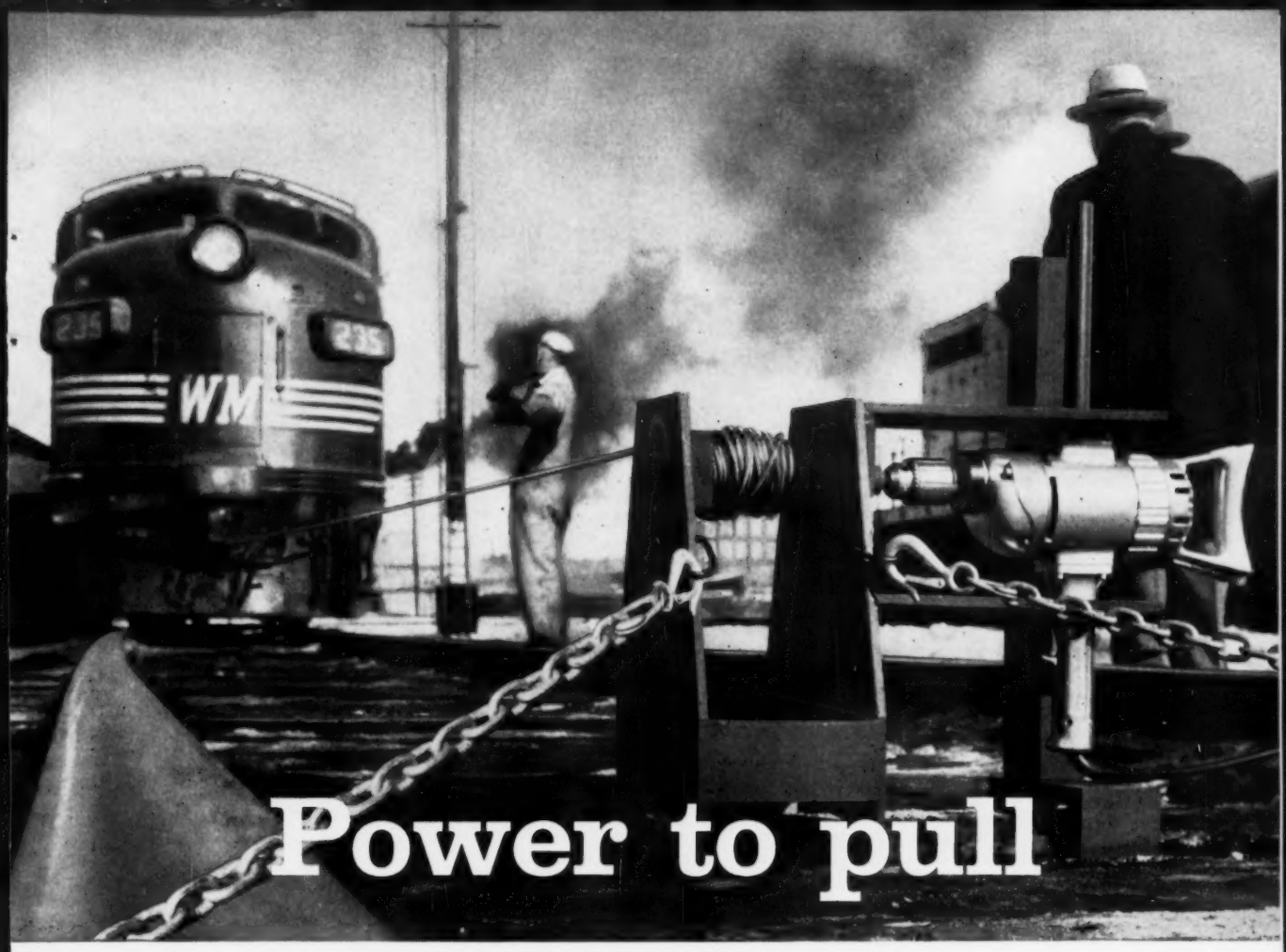
1. *Sets sharp changes of contour to permanent shape*
2. *Produces components within strict dimensional limits*
3. *Shearing can be combined with stamping of simple shapes*
4. *Skillful operators can develop and form many shapes difficult to form on any other type of press*
5. *Controlled blow is well suited to forming large integral parts*
6. *Low tooling cost and rapidity of die fabrication*

CECOSTAMP

CHAMBERSBURG ENGINEERING CO.

Builders of THE IMPACTER "FORGING IN MID-AIR"

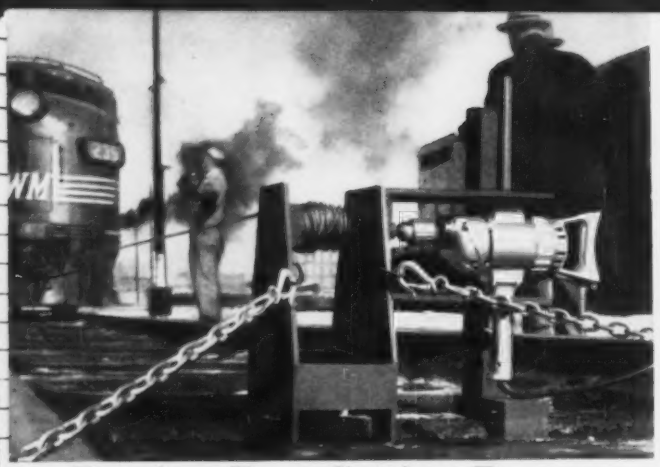
CHAMBERSBURG, PENNSYLVANIA



Power to pull a locomotive!

...yet they handle light, easy in any drilling job!

Read the exciting news about Black & Decker's new, pace-setting HEAVY-DUTY DRILLS!



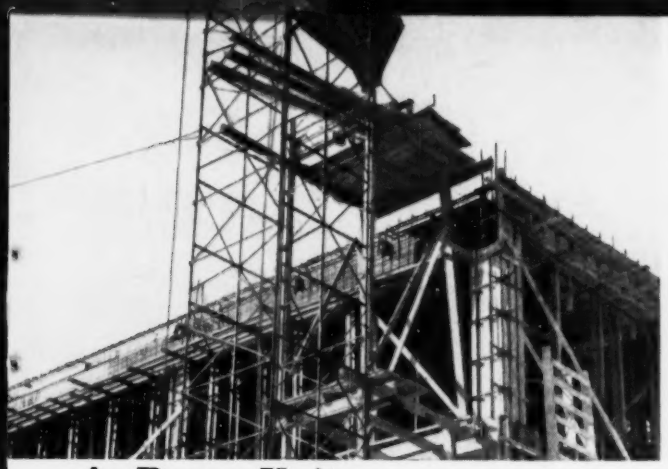
Proving Pace-Setting Power, new Black & Decker Heavy-Duty Drill—world's most powerful at rated capacity—can pull 115-ton Western Maryland R. R. Locomotive.

Drilling in Metal, these drills work faster, because their speed holds up under load. No need to go to heavier drills. You get the capacity you need with new Black & Decker Heavy-Duty Drills.

New Black & Decker® obsolete any

World's most powerful drills at their rated capacities!

New hi-torque Black & Decker-built motors give these heavy-duty drills amazing power for their size and weight. The $\frac{1}{2}$" model, for example, has double its former power and torque, more power than most 1" drills. Result: drilling jobs go faster because these drills have the guts to hold their speed under load.



As Power Units, the compact Black & Decker Heavy-Duty Drills adapt for speed reducers, chain and winch hoists, light elevators, dumb-waiters, and scores of other applications.

Driving a Big Auger is a drill-killing job. Yet new Black & Decker Heavy-Duty Drills take it in stride. New, longer handles make them easier to control at maximum torque output.

Heavy-Duty Drills drills you've ever tried!

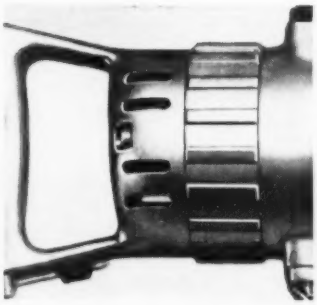
Full-power reversible feature built in at no extra cost!

New Black & Decker Heavy-Duty Drills have power to pull a locomotive—make rugged, compact power units—yet handle light and easy in any drilling job. That's because they're built to a new design concept that obsoletes all other drills of similar rated capacities. Here's why:

- **Brilliant, new B&D-built motors** give twice the power of their predecessors.
- **New reversible feature**—built in at no extra cost—gives full power in either direction.
- **New-type chuck** prevents slippage—can't come off when tool is reversed—yet is easily disassembled in seconds.
- **New handles** have been lengthened for easy control at maximum torque output.

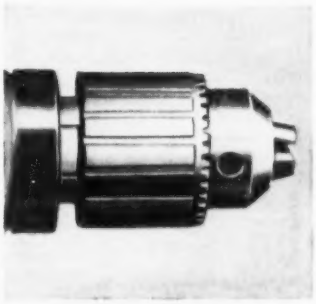
To speed your drilling—or as rugged Power Units!

These Black & Decker Heavy-Duty Drills have no match in industry today. You'll find them in ½", ⅝" and ¾" capacities at your nearby B&D distributor. Also 1" and 1¼" models available. Try them today—we guarantee you'll be amazed at the difference *modern* design has made in drills!



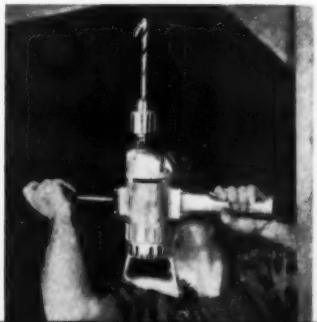
Completely reversible

First time in a heavy-duty drill—built in at no extra cost. With full power in either direction, reversible feature is operated by positive-action reversing switch ring shown here.



Exclusive, new-type chuck

Positive drive taper mounted chuck can't slip in either direction. Easily disassembled, without a press. Operator can change chuck and convert tool to power unit in seconds.

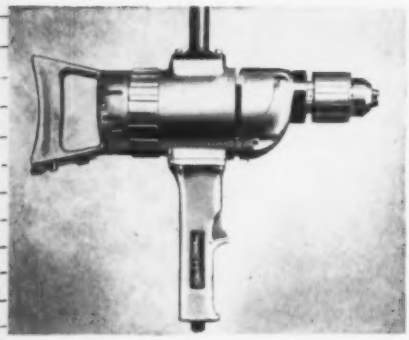


Perfect operator control

Switch and side handles have been lengthened for perfect operator control at maximum torque output. And for all their power, these drills weigh only a shade over 16 lbs.

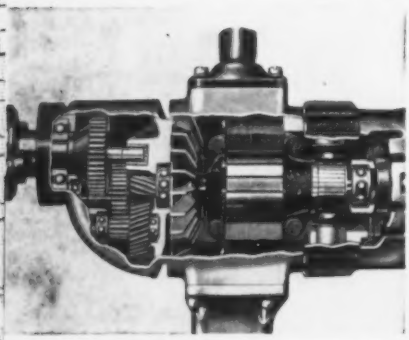
More Pace-Setter Features

. . . from the world's largest maker of portable electric tools!



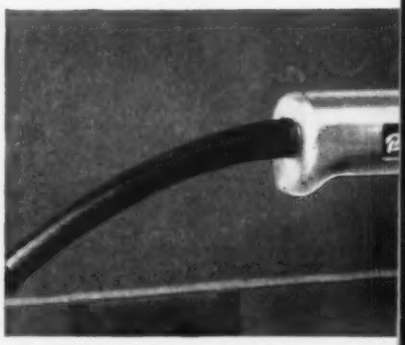
Sleek, streamlined design eliminates bulky appearance of old-fashioned drills. Makes tools more compact, easier to handle.

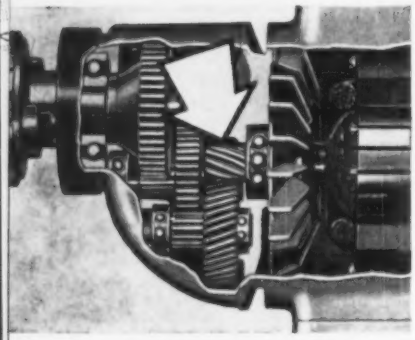
Instant-release trigger switch is mounted near end of switch handle for better operator control.



Full ball or needle bearings throughout give smoother, trouble-free operation.

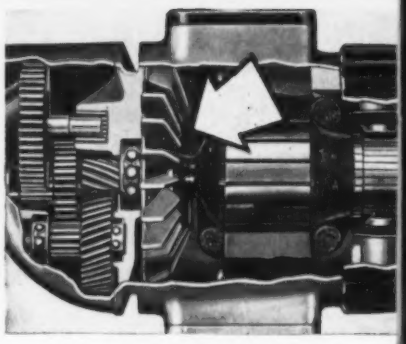
Less chance of cord breakage because cord protector and clamp are molded in one piece. Cannot be pushed in, pulled out or twisted.





"Nitrided" hardened helical gears are used for maximum wearing qualities and performance.

For maximum air flow and cool operation, these new drills use centrifugal type, cast aluminum fan.



You be the judge!

Make a date with your B&D distributor for a free demonstration of these revolutionary Drills. See if you don't agree they top any drills you've ever tried—in power, reversibility, easy handling and sheer quality! For additional information, write to: THE BLACK & DECKER MFG. Co., Dept. 0904, Towson 4, Md., U.S.A. (In Canada: 80-86 Fleet St., E., Toronto 2, Ont.)

Look Under "TOOLS-ELECTRIC" in 'Yellow Pages'

Leading Distributors Everywhere Sell

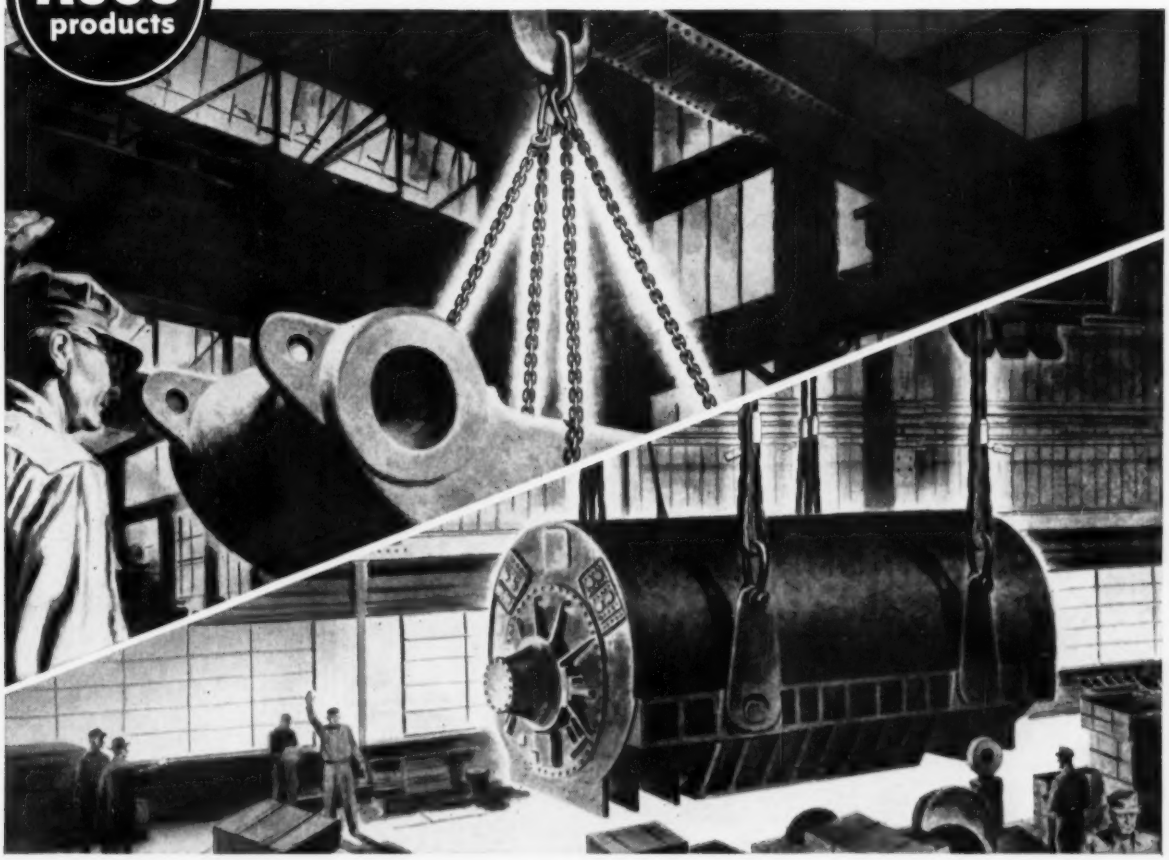
Black & Decker®

Portable Electric Tools—Power-Built to set the pace

ACCO products

Acco Registered* Slings–Wire Rope & Chain

THE STANDARD OF EFFICIENCY AND SAFETY



Why Acco *Registered* Slings are the Safest Slings Made

• Your job may demand Chain Slings, Wire Rope Slings—or a combination of both. Temperature, shape or weight of a load, protruding corners and many other factors tend to make one particular sling best for a particular application. But no matter what your requirements, ACCO has the right sling in its complete line of ACCO *Registered* Wire Rope & Chain Slings.

And with an ACCO *Registered* Sling you get the extra protection of the ACCO *Registered* program—extra safeguards which make ACCO *Registered* Slings the safest slings made.

Individually Proof-Tested • Each component of an ACCO *Registered* Sling is first tested to insure that it has strength at least equal to the sling body. All hooks for ACCO *Registered* Slings are Magnaflux tested. Then the slings are assembled according to carefully engineered designs which have proven their safety and effectiveness in extensive laboratory tests and field applications. The completed slings are then individually proof-tested at a load at least twice that for which the sling is rated.

Only after a sling has passed these rigorous tests is it registered. And this ACCO Registration is attested by a certificate and a ring or tag which are attached to the sling and accompany it to the user as his warranty of superior quality and safety.

New, Safer Master Link • Over the years ACCO has maintained a continuing research program to build more and more safety and quality into ACCO *Registered* Slings. The latest result of this research is a new and better master link for both chain and wire rope slings.

ACCO's engineers found that by shaping the master link in a particular fashion they could make it stand up under loads up to 18% greater than could standard round sections. You now get this new, stronger master link on all ACCO *Registered* Slings at no increase in price—together with the many other improvements developed by ACCO research over the years.

At Your Distributor • ACCO *Registered* Slings—Chain, Wire Rope or combination—are readily available from a distributor near you. Call him today for an extra bonus of safety in your lifting operations. If you don't know his name, write to our Bridgeport office.

*Trade Mark Registered

ACCO

AMERICAN CHAIN & CABLE

BRIDGEPORT, CONN.

Atlanta, Boston, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Wilkes-Barre, Pa., York, Pa.
In Canada: Dominion Chain Co., Ltd., Niagara Falls, Ont.

TRADE MARK

Better Value

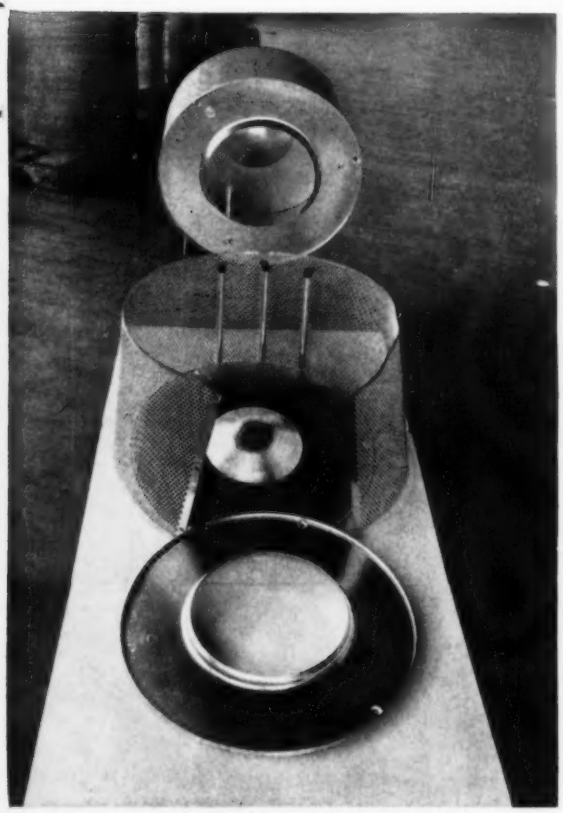
SIX-GOAL MAN FAILS TO FLAKE TI-CO®

Captain Pat Conners, six-goal man and captain of one of the Midwest's top polo teams, the Shamrocks, examines unflaked sheet of TI-CO after his repeated drives of a polo ball driven into it at 85 mph.

Not many applications require TI-CO's coating to withstand punishment equal to the 85 mph slam of a polo ball. But, you can see how this unusual test does demonstrate the ability of TI-CO to take the toughest fabricating operations . . . stamping, drawing, crimping, lock-seaming, brake forming . . . without cracking or flaking of the zinc coating.

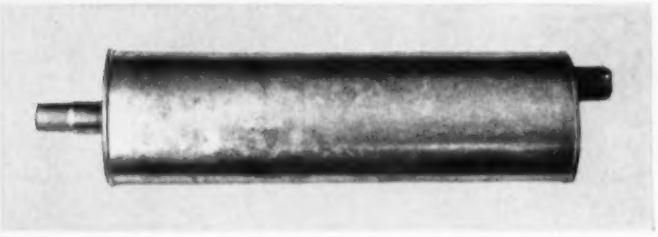
TI-CO's secret is in the patented Sendzimir process which produces a galvanized sheet with a tightly adhering zinc coating that "flows" with the base metal as it is being fabricated. In stamping and other forming operations, non-flaking TI-CO eliminates costly down time and clogging of machines.

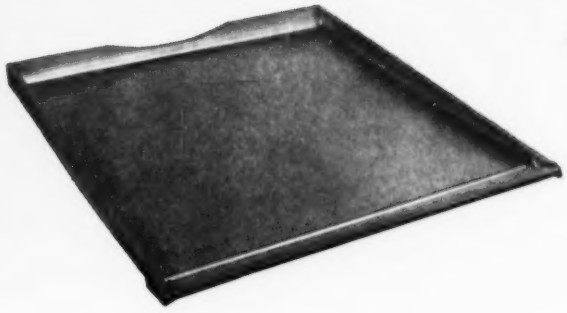
Corrosion resistant TI-CO adds saleability to top brand appliances and auto parts



This is the assembly for the inner drum of a popular brand automatic clothes dryer. When the manufacturer started using Inland TI-CO on this application he added the very important sales advantage of corrosion resistance. The tightness of the zinc coating on TI-CO Galvanized Sheets makes possible tough fabricating operations, such as the punching on the basket of this washer drum, without danger of flaking or peeling. Conventional pot galvanized sheets couldn't take it.

Automobile mufflers are subjected to severe corrosive conditions. Rapid temperature changes produce condensation inside the mufflers. Weathering goes on constantly outside. The manufacturer of this muffler gained superior durability and resistance to corrosion and weathering when he started using Inland TI-CO Galvanized Sheets. The life of the finished product was extended and saleability was increased.





This front panel of the cabinet for a leading automatic washer, as well as the complete wrap-around itself, is made from Inland TI-CO Galvanized steel. Why? Because at very little additional cost over ordinary steel the manufacturer added a demonstrable sales feature . . . protection against corrosion. TI-CO takes the sharp draw on the corners of this panel without flaking. The zinc coating stays put . . . maintaining over-all protection.

If you manufacture a product that could profit from this sales feature of built-in resistance to corrosion, even though its forming operations require superior ductility . . . it will pay you to investigate non-flaking Inland TI-CO Galvanized Sheets.

TI-CO galvanized sheets are now more readily available!

The terrific demand for this high quality sheet has kept TI-CO in short supply since its development. Now, additional production facilities have been completed making greater quantities available.

TI-CO is available in cut sheets or coils, in gages 8 to 30 inclusive and widths as great as 60 inches. TI-CO comes with dry, oiled or chemically treated surfaces. Consult your Inland representative for your requirements.

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

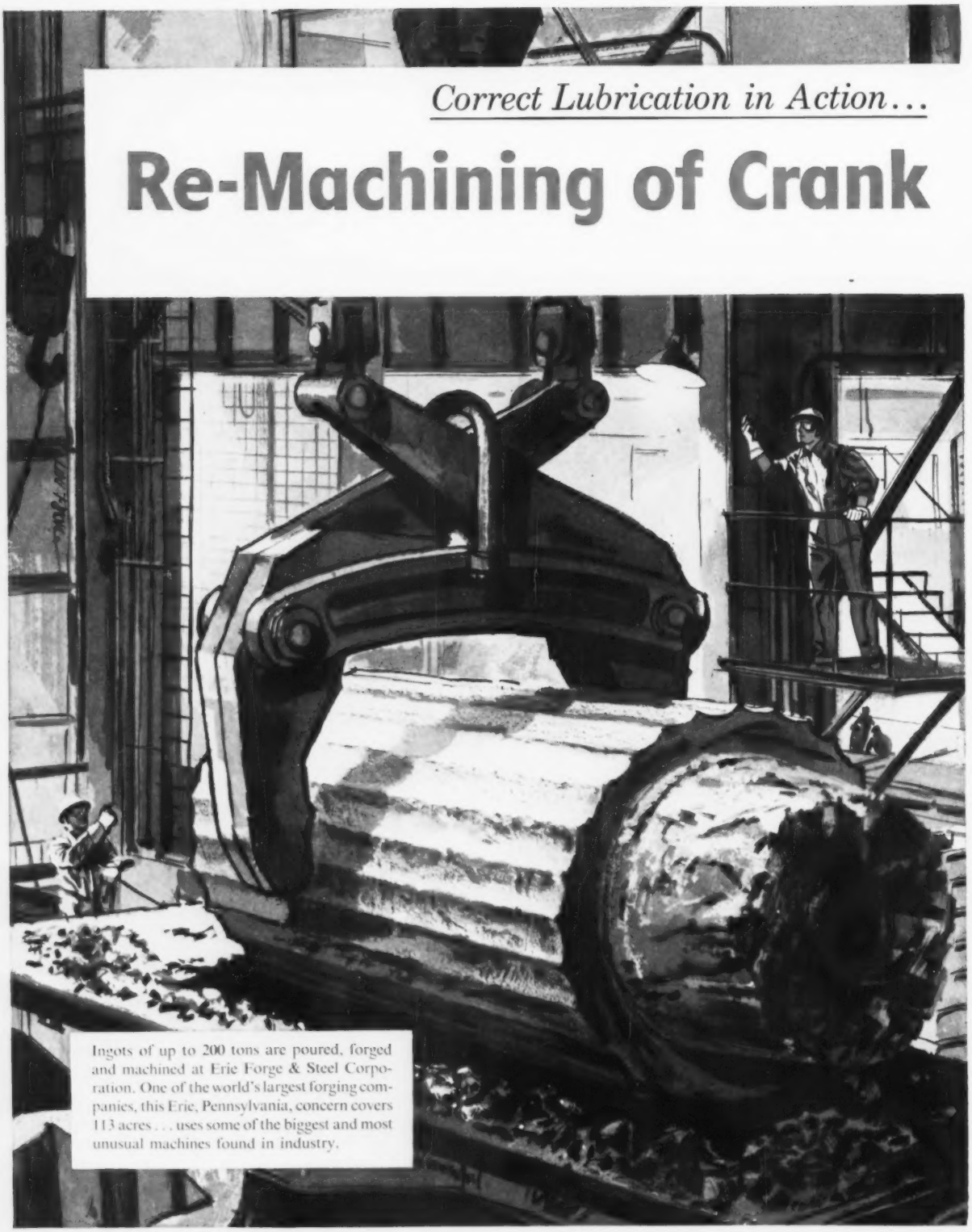
Sales Offices: Chicago • Milwaukee • St. Paul • Davenport St. Louis • Kansas City • Indianapolis • Detroit • New York

INLAND TI-CO ®

Look for this brand—
your assurance of
non-flaking performance

Correct Lubrication in Action...

Re-Machining of Crank



Ingots of up to 200 tons are poured, forged and machined at Erie Forge & Steel Corporation. One of the world's largest forging companies, this Erie, Pennsylvania, concern covers 113 acres . . . uses some of the biggest and most unusual machines found in industry.

Mobil

SOCONY MOBIL

Leader in Lubrication for over 91 years

in the **Forging Industry**

shaft Pins Eliminated

–$30,000 SAVED!

One of many ways Erie Forge & Steel Corporation has cut production costs over $100,000 through the help of Socony Mobil

At Erie Forge & Steel Corporation, where the world's largest crankshafts are produced, equipment and methods are constantly scrutinized for ways to increase production and reduce maintenance costs. Plant records show how Socony Mobil has helped.

For example: During machining of Diesel crankshaft pins, metal particles welded to cutting tool tip. This excessive build-up resulted in rough finish of pin surfaces. This necessitated re-machining of up to 18 crankshaft pins a day.

A Mobil lubrication engineer analyzed the operation . . . recommended a special Mobil cutting oil. Rough finish trouble disappeared, resulting in savings of $30,000 in one year. *This one saving alone more than paid for the plant's annual cost of lubricants.*

This is Correct Lubrication in Action—the *only* program that combines 91 years of lubrication knowledge with the most experienced lubrication engineers and quality products. Why not find out how it can cut your operating costs?

This complete cost-cutting service can be yours!

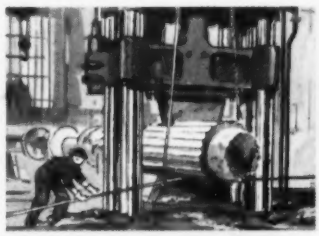
After a Mobil representative thoroughly analyzes your plant's lubrication needs, a program of Correct Lubrication is put into action. Here are some of the ways this program benefited the Erie Forge & Steel Corporation.

World's Greatest Lubrication Knowledge—Since 1866, Socony Mobil has worked with every type of industry, on every kind of machine operation. **This vast experience enabled Mobil to suggest a cleaning method to Erie Forge that eliminated monthly dismantling of hydraulic and circulating systems . . . saved $49,719 in four years.**

Continuous research and product development—Socony Mobil products are continually improved . . . new products developed to meet industry's latest needs. **A new Mobil extreme-pressure gear lubricant was recommended for Alliance 75-ton cranes. It cut wear under overload conditions . . . prolonged gear life . . . saved $1,500 in labor and material cost.**

Periodic product analyses—This service provides a thorough check on lubricant and machine performance . . . can detect trouble before it reaches the serious stage. **Analyses of samples taken from central coolant system at Erie Forge indicated bacterial contamination. Steps were taken to arrest condition, thus avoiding shutdown of all boring and sawing operations.**

Experienced engineers—Mobil engineers work closely with plant personnel . . . can call on years of practical experience to cut plant production costs. **At Erie Forge & Steel Corporation rams on hydraulic presses had to be repacked every two weeks due to high-temperature operation. Recommendation by Mobil engineer greatly extended packing life . . . cut labor costs . . . saved $20,000 in four months.**



Correct Lubrication

A proved program to reduce maintenance costs

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM CO., GENERAL PETROLEUM CORP., MOBIL OVERSEAS OIL CO., INC.

2,300,000 pounds ship-to-shore in one hour!

Westinghouse-equipped ore unloaders set new highs in speed and dependability for McLouth Steel

Power. Durability. Precision. These were the requirements for the motors and controls to operate these two 547-foot ore bridges for McLouth Steel. Westinghouse supplied the solution with rugged MC mill motors and the newest developments in automatic controls—Magamp* and Rototrol®.

In just 41 seconds, these ore bridges run a complete cycle—digging, hoisting, trolleying, dumping, rehoisting and back again for another 27,000-pound scoop.

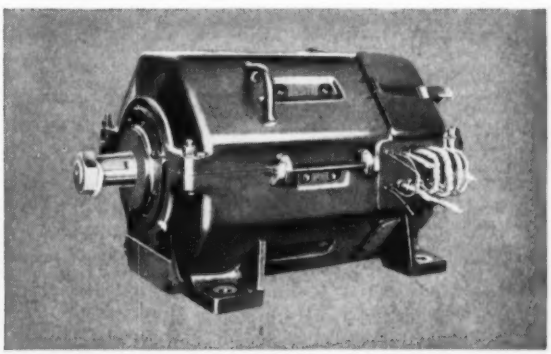
It will pay you to investigate the facts that give such outstanding results as these when you are considering motors, drives and controls. Get the details from your Westinghouse sales engineer. Or write Westinghouse Electric Corporation, 3 Gateway Center, P.O. Box 868, Pittsburgh 30, Pennsylvania.

*Trade-Mark
J-21957

YOU CAN BE SURE...IF IT'S

Westinghouse

These two new ore bridges can unload all size boats by means of an adjustable "apron" which can be raised high enough to allow the mast of any vessel to pass underneath. Dependable Westinghouse hold-and-close motors carry the load on this modern installation.



Rated at 187½ hp, 230 v, 460 rpm, this 616 Series mill motor gives the kind of outstanding performance to meet today's tougher, faster jobs. Westinghouse engineers are ready to work with you to give you the best motors and controls for your needs.

Picture of Five Wheelbarrows

What makes an HA PAYLOADER® best for your job?

Shortest turning radius
Higher dumping height
Biggest Bucket (18 cu. ft. payload)
Hydraulic load-shock-absorber
40° bucket tip-back at ground level
Exclusive one-lever bucket control

THE FRANK G. HOUGH CO.
733 Sunnyside Ave., Libertyville, Ill.

Send data on "PAYLOADER" tractor-shovels
☐ Models HA (18 cu. ft.) and HAH (1 cu. yd.)
☐ Larger models to 2¼ cu. yd.

Name _____

Title _____

Company _____

Street _____

City _____

State _____

56F

Of course you don't see 5 wheelbarrows, but you do see one man on a model HA "PAYLOADER" at the foundry of Domestic Pump & Mfg. Co., Shippensburg, Pa., and the management says it does as much work as 5 men with wheelbarrows handling sand, castings and scrap. Foundries and metal-working plants everywhere like this "PAYLOADER" because it can travel and work where others can't — negotiate narrow aisles, boxcar doors and corners. Yet it boasts a bigger bucket (18 cu. ft. payload) and can dig more, carry more and deliver more tonnage than any tractor-shovel anywhere near its size.

It will pay you to find out what this new style model HA or a larger "PAYLOADER" can do for you. Your nearby Distributor is willing to demonstrate and also tell you about the extra useful attachments — sweeper, fork lift, tine bucket, snow plow, etc. See him today.

SAY "HUFF"

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

IH

Another Plus . . . from Brainard

Tubing:

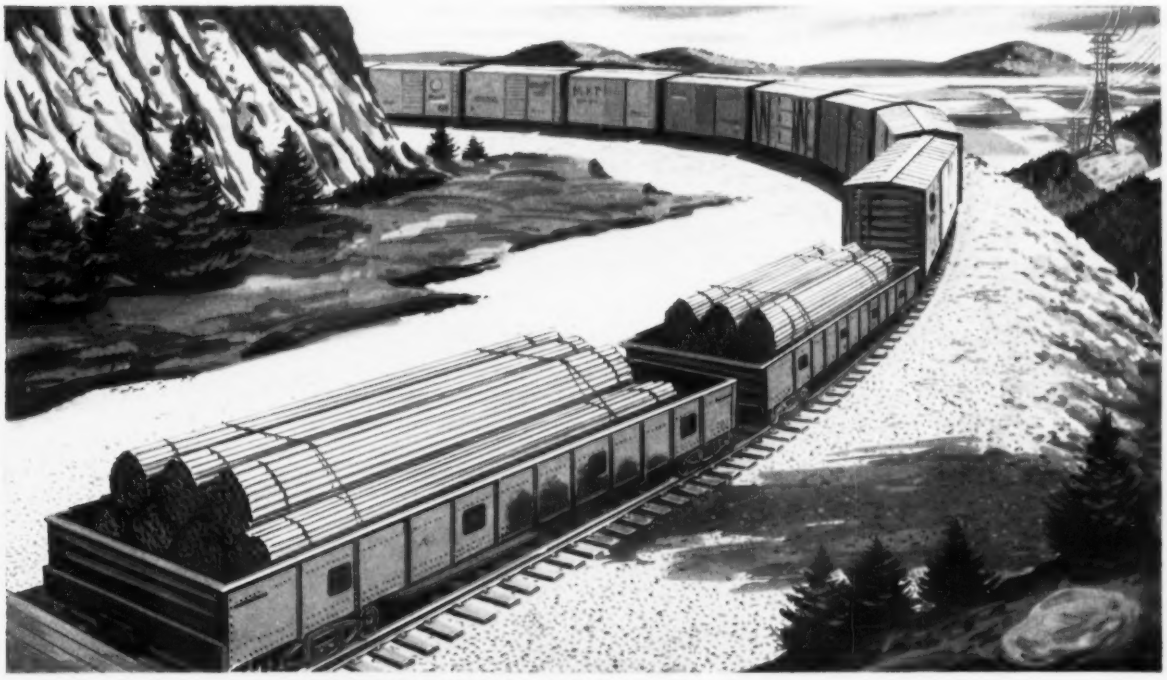
Assured delivery from an integrated mill...

As a buyer of steel tubing, what does the phrase . . . "from an integrated mill" mean to you?

To most of our customers it means just this: no company likes to have its markets jeopardized by production slow downs resulting from material shortages. When the "material" happens to be tubing and the supplier is an integrated mill such as Brainard, such shortages are virtually nonexistent.

As an integrated mill, Brainard is not dependent on outside material sources. The corporation of which Brainard is a part controls tubing production from raw material source to finished product: thus customers are assured of an uninterrupted supply.

So, whether you buy tubing in small quantities or carload lots, you can benefit from this year-in-year-out dependability of supply by placing your orders with Brainard.



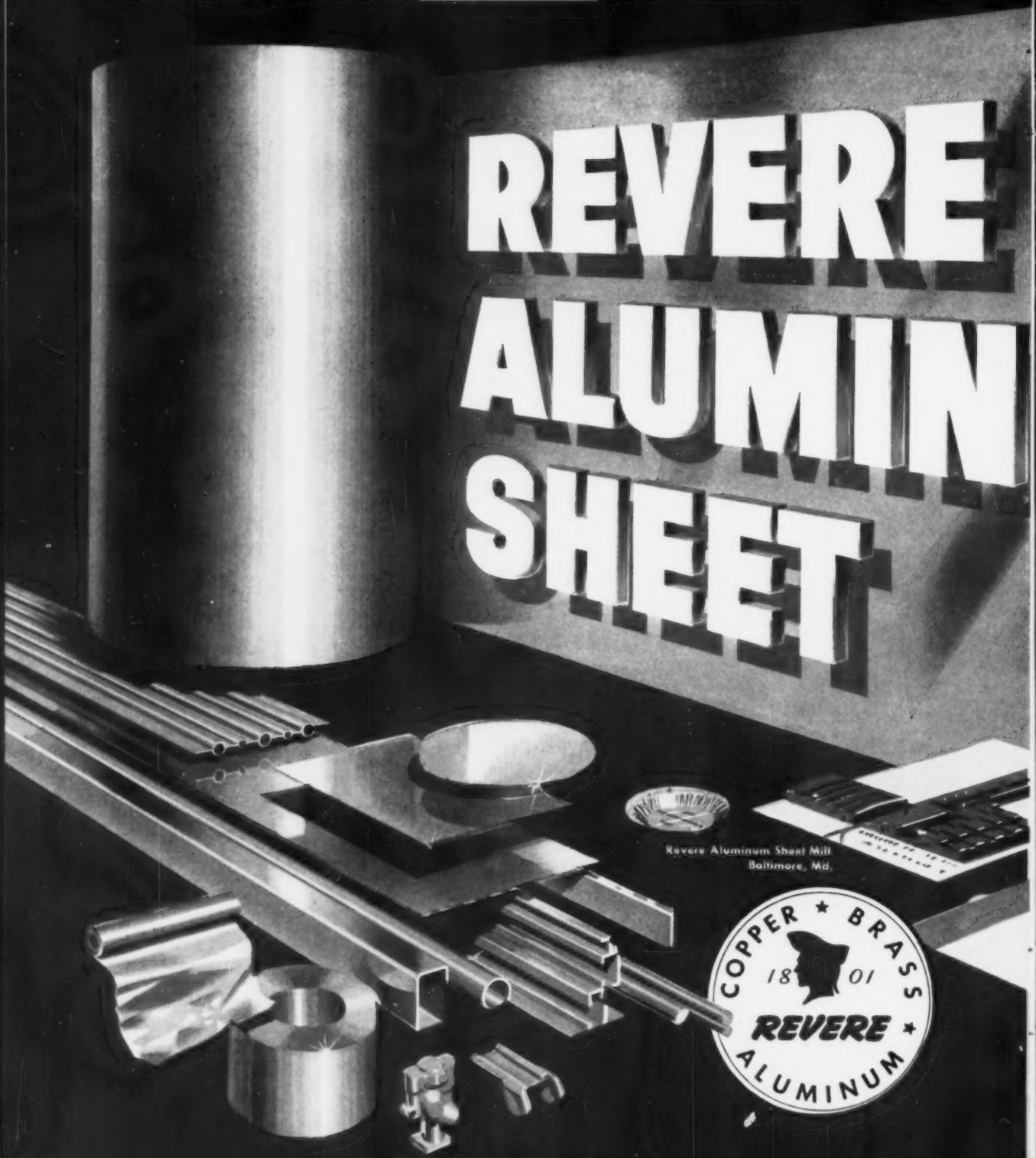
Brainard Steel Tubing

SHARONSTEEL

Brainard Steel Division, Sharon Steel Corporation
Griswold Street, Warren, Ohio

Ready, Set, GROW...with

REVERE ALUMIN SHEET



Revere Aluminum Sheet Mill
Baltimore, Md.

COPPER ★ BRASS
18 01
REVERE
ALUMINUM

New Revere Aluminum Sheet Mill
Chicago, Ill.

You will find that Revere Aluminum Sheet passes smoothly and economically through your processes, that it brings to your products all the advantages you expect from fine aluminum.

Three Revere plants, located in the East, the Mid-West and on the Pacific Coast, can bring mill service and technical consultation close to your own doorstep. These plants will have the backing of Revere's primary aluminum operation, scheduled to begin production in 1958.

It will pay you to tie the growth of your business to the most dependable sources of supply—such as Revere, which is in aluminum in a BIG WAY. Revere Copper and Brass Incorporated. Founded by Paul Revere in 1801. Executive Offices: 230 Park Avenue, New York 17, N. Y.

Revere Aluminum Mill Products include coiled and flat sheet, both plain and embossed, circles, blanks, Tube-In-Strip, extruded products, seamless drawn tube, welded tube, rolled shapes, electrical conductors, forgings, foil and frozen food containers.

← Projected for 1957: New Revere Aluminum Sheet Mill Santa Ana, Calif.

10% Faster Welding Speed *results from using Jetweld LH-70 for welding nickel-chrome-moly blocks and hangers to forging in fabricaton of forks for lift trucks. Courtesy Joseph Dyson Company, Cleveland, Ohio.*

DEPENDABLE FOR HIGH-SPEED WELDING OF CRACK-SENSITIVE STEELS

Jetweld LH-70 by Lincoln
low-hydrogen, iron-powder, E-6016 electrode

Dependable Welding for
Crack-sensitive steels • Alloy steels without preheating
Medium to high carbon steels • Free machining steels

Higher Deposition Rate
Than conventional low-hydrogen electrodes

Easy Operation
In all positions with high currents

Conforms to
Class requirements of E-6015, E-7015 and E-7016
Meets X-ray requirements

OPERATES ON AC OR DC

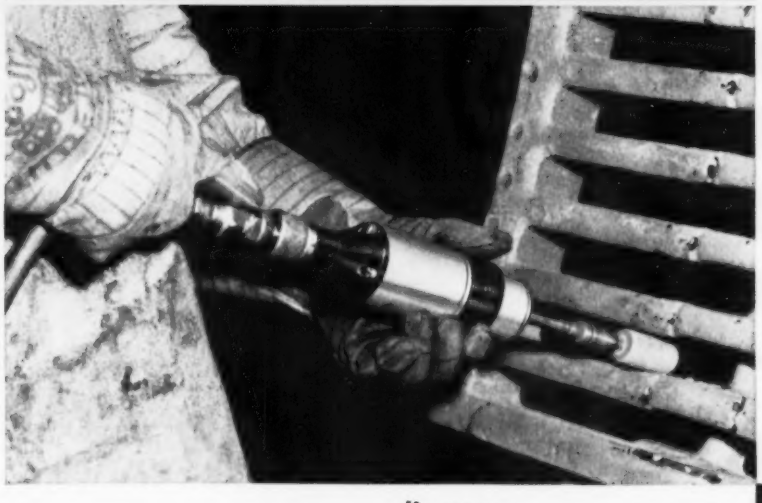
Write for Bulletin SB-1351 for specifications.

THE LINCOLN ELECTRIC COMPANY

Dept. 1530 • Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

NEW ROTOR "117" series Small-Wheel Air Grinders



Check these features:

Governed for top production. Runs at best practical working speed for *maximum power.* Available in 17,000, 12,000 or 8,000 rpm.

Quiet. Designed for quiet operation.

Wide selection. You can select from over 150 different combinations of speeds, spindles and throttles to do *your* job.

Ask the Rotor Application Engineer for a demonstration on your job. Bulletin 59 free on request. The ROTOR TOOL Company, Cleveland 32, Ohio.

Here's the RIGHT TOOL for YOUR job!

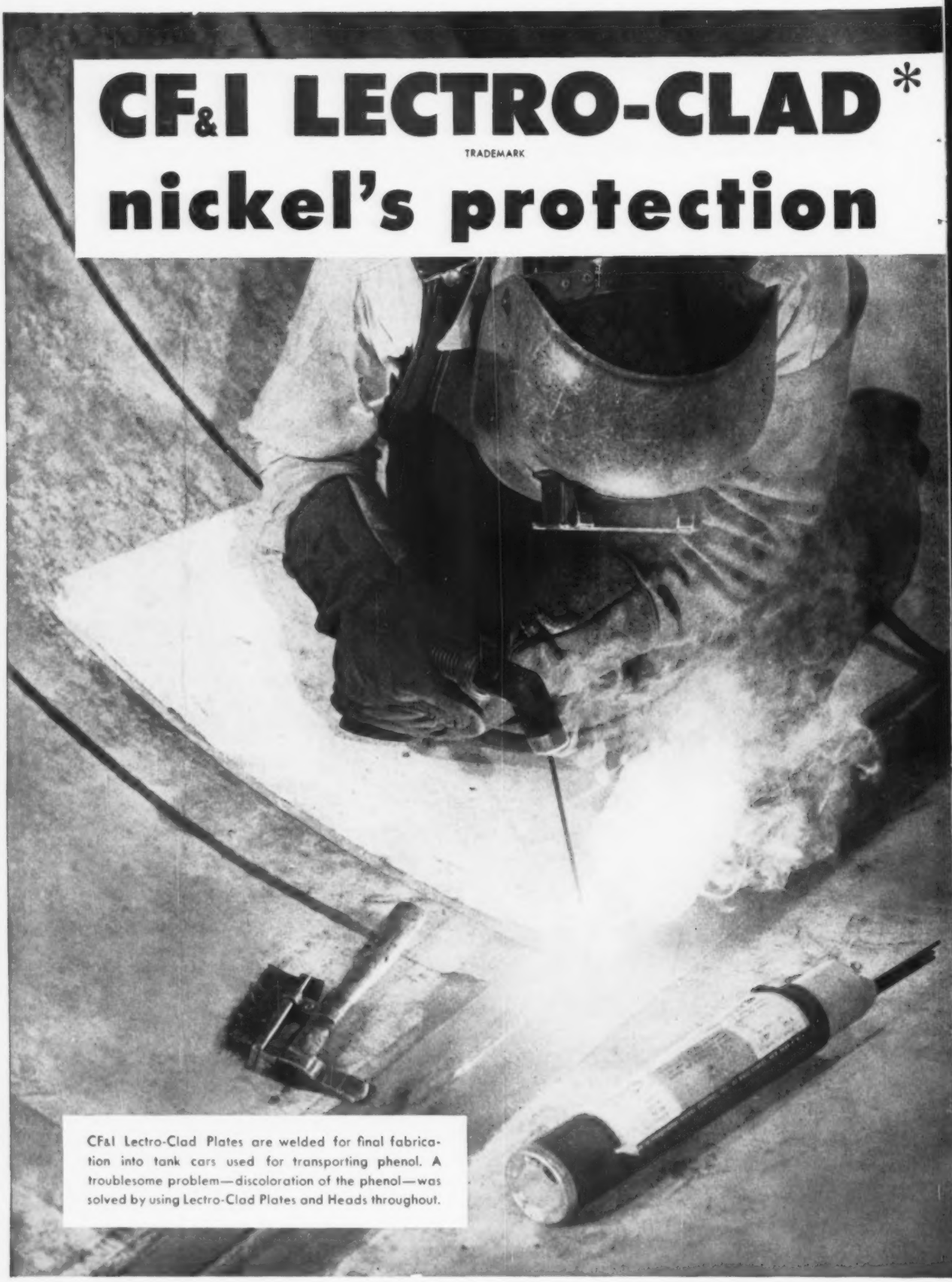
Rotor Air Tools: Assembly Tools • Drills • Small Wheel Grinders
Straight Grinders • Vertical Grinders • Scalers • Chippers • Rammers
Rotor High-Cycle Electric Tools: Grinders • Polishers • Sanders

ROTOR TOOLS®
CLEVELAND, OHIO

CF&I LECTRO-CLAD*

TRADEMARK

nickel's protection



CF&I Lectro-Clad Plates are welded for final fabrication into tank cars used for transporting phenol. A troublesome problem—discoloration of the phenol—was solved by using Lectro-Clad Plates and Heads throughout.

PLATES offer you... plus 6-8 week availability

Stop waiting months for delivery on nickel and nickel-clad plates! Switch to CF&I Lectro-Clad Nickel Plated Steel. Smart fabricators and end-users all over America are finding that this dependable product successfully combines the protection of nickel and the economy and strength of carbon steel. AND CF&I LECTRO-CLAD NICKEL PLATED STEEL PLATES ARE AVAILABLE WITHIN 6 TO 8 WEEKS!

CF&I Lectro-Clad Plates and Heads are now being used successfully in many transportation and storage applications where product contamination or discoloration is a problem. They are also effective for processing applications where the corrosion rate does not exceed .0015 inches per year. CF&I Lectro-Clad is customarily supplied with 8-10 mil nickel plating; however, it can be plated up to 28-30 mils if specified.

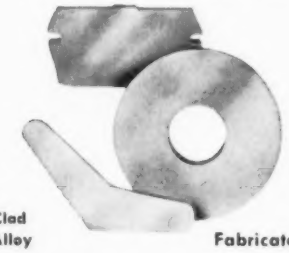
CF&I Lectro-Clad is easy to fabricate. It can be worked with regular shop equipment. Bend it . . . weld it . . . roll it . . . the protective nickel layer stays firmly bonded to the steel. It will not check, spall or flake.

Delivery time on this 8-foot diameter caustic evaporator was reduced by one full year when its fabricator switched to CF&I Lectro-Clad. Plate used was 3/8" steel with a 15 mil layer of nickel. Heads were also fabricated from Lectro-Clad.

For the complete story on Lectro-Clad, ask for the Lectro-Clad Nickel Plated Steel Technical Manual. Contact our nearest sales office or write us direct. Wickwire Spencer Steel Division, The Colorado Fuel and Iron Corporation, P. O. Box 1951, Wilmington, Delaware.

OTHER CLAYMONT PRODUCTS

Steel Plates
Alloy • Stainless Clad
High Strength Low Alloy



Fabricated Steel Parts

Flanged and
Dished Heads
Manhole Fittings
and Covers

Large Diameter
Welded Steel Pipe

CF&I

Claymont Steel Products

Products of Wickwire Spencer Steel Division • The Colorado Fuel and Iron Corporation

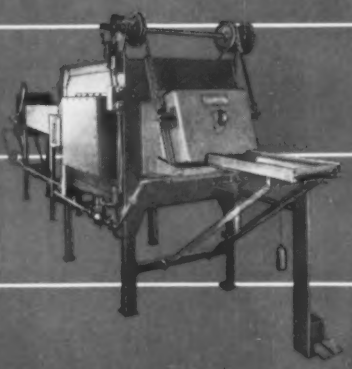
Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit • El Paso • Ft. Worth • Houston • Lincoln
Los Angeles • New Orleans • New York • Oakland • Odessa • Oklahoma City • Philadelphia • Phoenix • Portland (Ore.) • Pueblo • Salt Lake City • San Francisco
Seattle • Spokane • Tulsa • Wichita • CF&I OFFICES IN CANADA: Montreal • Toronto • CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

***NICKEL PLATED BY THE BART LECTRO-CLAD PROCESS**

4338

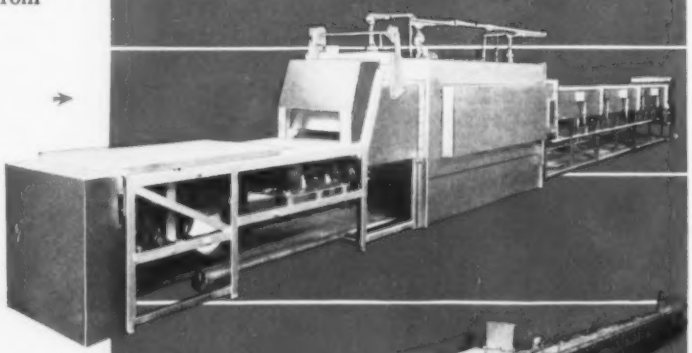
Look to Lindberg for Sintering Furnaces

For sintering furnaces, just as in all types of industrial heating equipment, you can depend on Lindberg's ability to supply exactly the right equipment for your needs. Here are some typical Lindberg sintering furnaces:



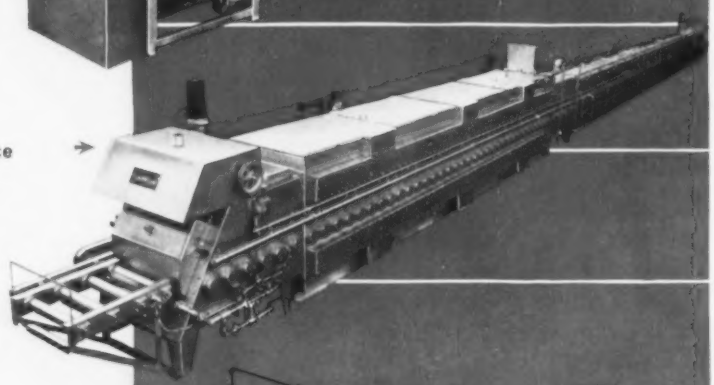
This Hand Pusher Batch Type Furnace →

is used for small production lots and experimental sintering. It is an all-purpose unit for operation from 1300°F to 2500°F. Made in various sizes for sintering from 25 to 300 pounds per hour.



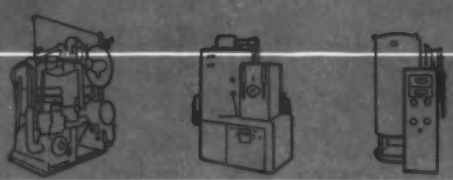
This Mesh Belt Continuous Type Furnace →

is a popular sintering furnace for small light parts in copper, bronze, brass or steel with a temperature range from 1300°F. to 2100°F. It can be used for low temperature silver brazing, bright annealing, as well as sintering of powder metals. Production ranges up to 500 pounds per hour.



This Roller Hearth Continuous Type Furnace →

is especially designed to handle heavier loads up to 2200 pounds per hour. It has an effective temperature range from 1300°F. to 2100°F. It can be used for bright annealing, low temperature silver brazing as well as sintering of powder metals.



Atmosphere Generators →

To obtain the best work from any sintering furnaces, the proper atmosphere is required. The atmosphere generators described here provide the proper atmospheres recommended for use with Lindberg Sintering Furnaces.

If you have a sintering or brazing problem why not talk it over with Lindberg. Just get in touch with your nearest Lindberg Field Representative or write us direct.

1. The HYEX Generator produces atmosphere composed of approximately 4% carbon dioxide—19% hydrogen—12% carbon monoxide and 66% nitrogen.

2. The HYEN Generator produces a neutral atmosphere composed of approximately 21% carbon monoxide—40% hydrogen—38% nitrogen and 1% methane.

3. The HYAM Generator produces atmosphere composed of approximately 75% hydrogen and 25% nitrogen.

LINDBERG

ENGINEERING COMPANY

Los Angeles Plant: 11937 S. Regentview Ave., at Downey, Cal.

2452 W. HUBBARD ST., CHICAGO 12, ILL.

Crucible gives you

wide selection,

dependable delivery of

Cold Rolled Specialty Steels

For a *full* selection of cold rolled specialty steels — call Crucible. Deliveries are on-schedule — in the size, grade, finish or length you need.

And Crucible's new mill facilities mean closer control of rolling . . . insure greater physical uniformity . . . fine finish . . . better edges . . . flatter strip.

Whether you use carbon spring steel, alloy strip steel, or many other ferrous analyses that can be cold rolled, you can't beat Crucible. More information is contained in the 32-page booklet, "Cold Rolled Specialty Steels". Write for your free copy now. *Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

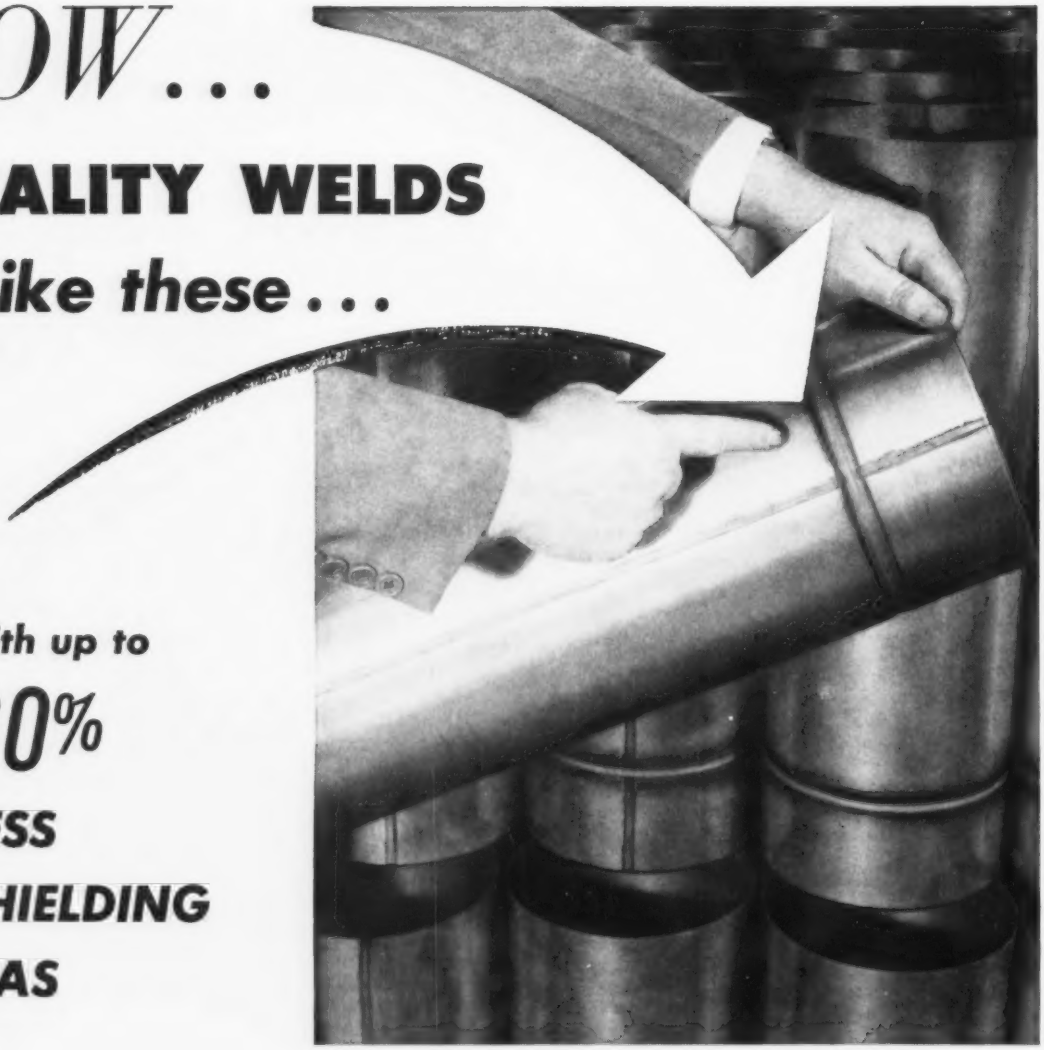
CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

NOW...

QUALITY WELDS

like these...



with up to

60%

LESS SHIELDING GAS

H-15 argon-hydrogen mixture means new economy in fast, sound welding operations.

Using H-15, a LINDE mixture of argon and hydrogen shielding gases, savings as high as 60% of normal gas consumptions are being attained by manufacturers on a wide variety of metal products. This mixture is designed for extremely efficient mechanized welding of stainless steel, Monel, Inconel, and cupro-nickel.

COMBINES ADVANTAGES—H-15 mixture combines the high welding speed feature of Helium with the low consumption advantages of argon—result, the lowest cost, high-quality welding yet attained . . . And no extra equipment is needed for a change over to H-15.

Get the complete story of this highly efficient, economical mixture, contact your local LINDE representative. Start saving now—do it today.

Linde Air Products Company

A Division of Union Carbide and Carbon Corporation

30 East 42nd Street UCC New York 17, N. Y.

Offices in Other Principal Cities

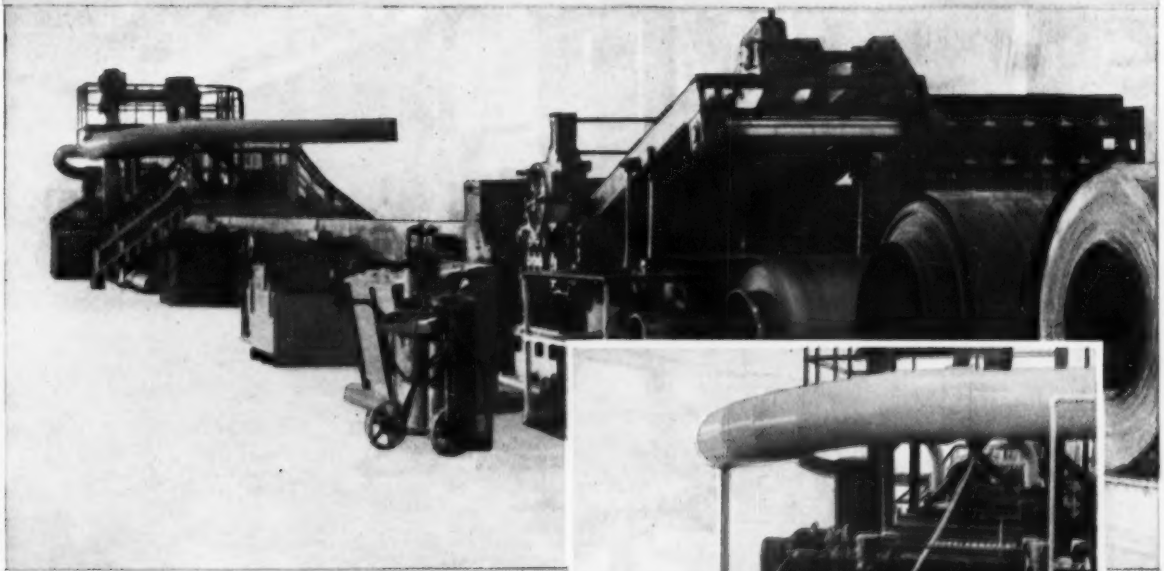
In Canada: LINDE AIR PRODUCTS COMPANY

Division of Union Carbide Canada Limited, Toronto

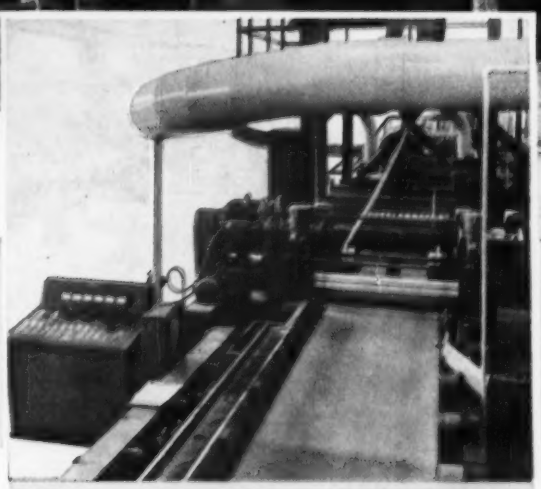
The term "Linde" is a registered trade-mark of Union Carbide and Carbon Corporation.

Linde
Trade-Mark

Stamco * heavy gauge feeding equipment and trimmers



CONE PAYOFF STRIPPER, FLATTENER AND SHEAR



SIDE TRIMMER AND SCRAP CUTTER

Stamco has the equipment you need. If you use trimming units, plate shears, slitting units, coil openers, or ANY OTHER SPECIAL steel mill equipment, you will be money ahead if you contact STAMCO. Call or write us today. No obligation.

STAMCO, INC., NEW BREMEN, OHIO, U.S.A.

INSIDE INFO FROM HOLO-KROME

THE SECRET'S IN THE SOCKET!

Holo-Krome's forging method assures untapered sockets . . . lets the hex key bear evenly and firmly against the entire socket wall. The result: easier, faster assembly . . . longer key life . . . fewer damaged screws!

No wall taper in Holo-Krome sockets!

Compare These Other H-K Features!

COMPLETELY FORGED SOCKET HEAD . . . no drilling or broaching—metal fibers stay intact for stronger hex sockets.

SCIENTIFICALLY DESIGNED SOCKETS . . . depth carefully proportioned to give greatest head and socket strength, firmest key grip.

SHARP HEX CORNERS . . . carefully formed socket corners resist internal reaming.

For the finest in Socket Screw products . . . for revolutionary SAME-DAY SERVICE, the name to remember is Holo-Krome!

LOOK INSIDE A HOLO-KROME SOCKET!

Send in the coupon below and we'll send you FREE an H-K Socket Cap Screw (we've omitted heat treating to let you get a better look at the mirror finish and sharp hex corners under the usual black finish). Look it over carefully, and see for yourself what a real difference H-K quality and skill can make!

Please send me FREE a Holo-Krome Socket Screw for my inspection.

NAME _____

POSITION _____

COMPANY _____

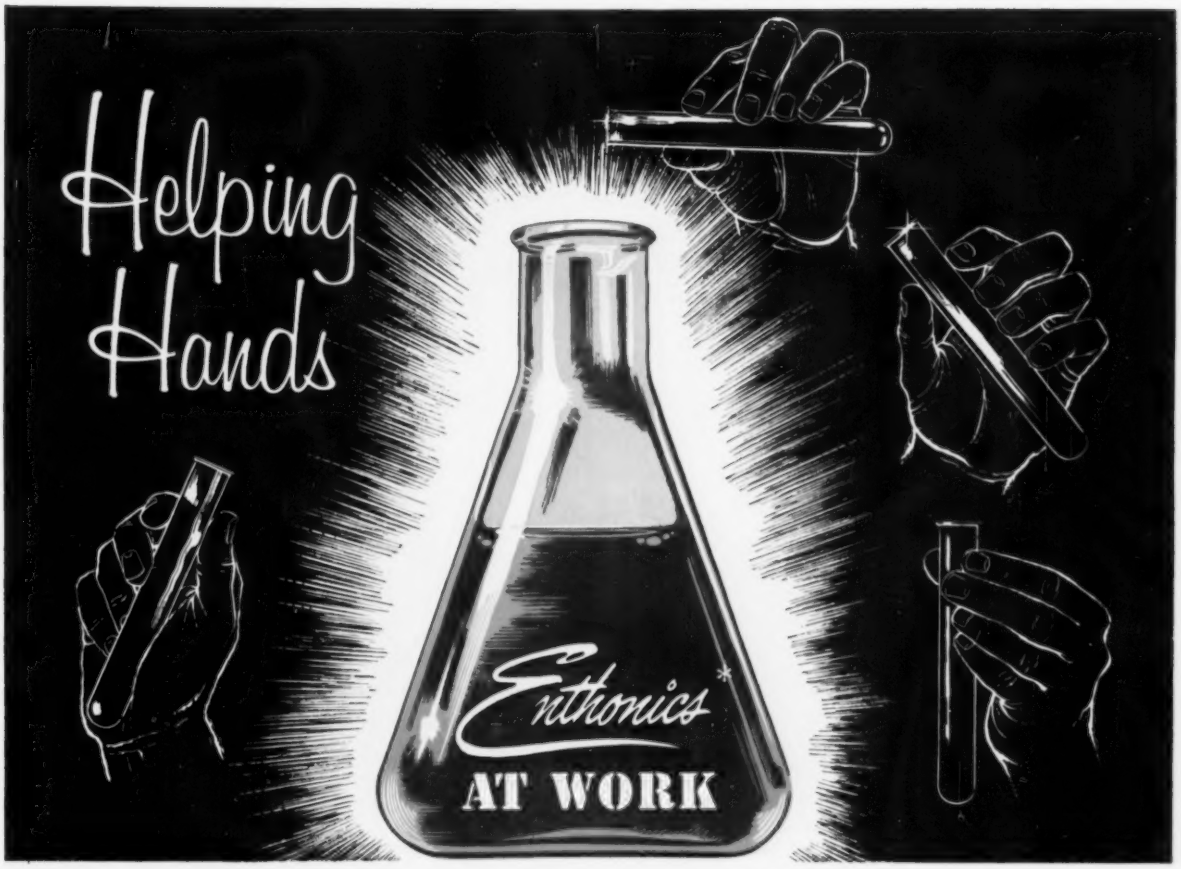
ADDRESS _____

CITY _____ ZONE _____ STATE _____

HOLO-KROME

THE HOLO-KROME SCREW CORP., HARTFORD 10, CONN.

Sold only through authorized Holo-Krome distributors.



FROM THOUSANDS of TESTS . . .

. . . *come the solutions to your metal finishing problems.*

If *you* are looking for creative chemistry to supply new methods for the improvement of metal finishing, look to the leader – ENTHONE. Write for the answers to these problems, identifying them by number. If your specific problem is not listed, Enthone will gladly help to find the answer.

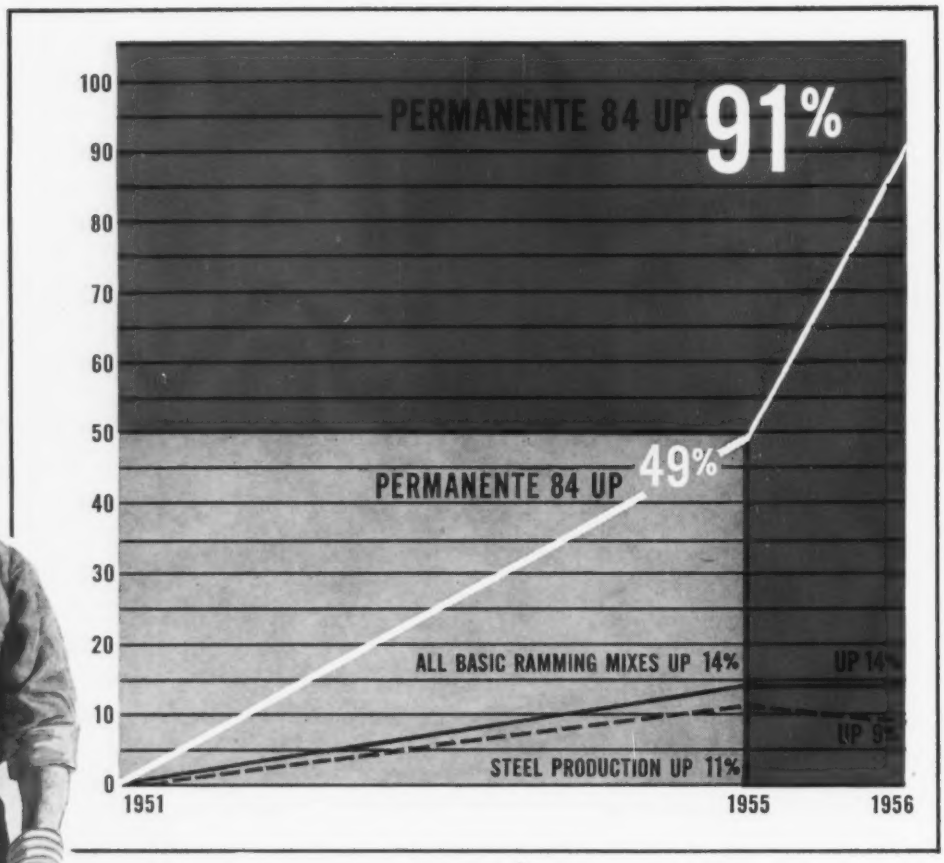
1. HOW TO BLACKEN copper, brass, zinc, steel and other metals to meet U.S. Government specifications.
2. HOW TO STRIP NICKEL from steel without etching the steel.
3. HOW TO STRIP NICKEL from copper and brass without attacking the part.
4. HOW TO SHED WATER from metals to prevent staining or spotting during drying.
5. HOW TO TRAP FUMES from hot sulfuric acid pickles.
6. HOW TO STRIP SYNTHETIC ENAMELS from aluminum and other metals without attacking the metal.
7. HOW TO CLEAN AND REMOVE RUST AND OXIDES from steel in one operation without acids.
8. HOW TO RINSE AND DRY STEEL WITHOUT RUSTING, using cold or hot water.
9. HOW TO SHORTEN ALKALI CLEANING TIME for steel to 15 seconds.
10. HOW TO REMOVE SOLID DIRT AND OIL from metals.
11. HOW TO STRIP LEAD, TIN or soft solder from copper and brass with no etching.
12. HOW TO PLATE METALS upon aluminum.
13. HOW TO REMOVE EXCESS SILVER SOLDER chemically from silver brazed steel parts.
14. HOW TO MAKE PAINT STICK to brass and zinc.
15. HOW TO SOLVENT-CLEAN parts and assemblies with cold non-hazardous solvent.
16. HOW TO OVERCOME CHROMIC ACID CONTAMINATION in cleaners.
17. HOW TO PREVENT STAINING of chromium plate.
18. HOW TO GIVE ZINC AND CADMIUM high salt spray resistance.
19. HOW TO COLOR ALUMINUM in one operation.
20. HOW TO STRIP METAL COATINGS from zinc die castings.

** The Scientific Solution of Metal Finishing Problems.*

ENTHONE INCORPORATED

442 ELM STREET, NEW HAVEN 11, CONNECTICUT

Metal Finishing Processes • Electroplating Chemicals



Why this ~~growing~~ *soaring* preference for Permanente 84 Ramming Mix?

A year ago, we ran an ad showing how sales of Permanente 84 to steel producers had increased 49% during the same 5-year period that sales of all basic ramming mixes increased only 14%.

But now after just one more year, steel producers' preference for Permanente 84 has pushed its sales increase up to *a whopping 91%!*

Why such an overwhelming preference? Briefly, here are the reasons:

Permanente 84 reduces the cost of maintaining furnace bottoms and banks. Repairs made with Permanente 84 stay put! Down time for hot repairs is reduced. Steel production goes up—costs come down. Ideal for hot patching both open hearths and electric furnace banks and bottoms.

Order Permanente 84 now and get extra steel tonnage at lower cost.

Call or write Kaiser Chemicals Division, Dept. R7141, Kaiser Aluminum & Chemical Sales, Inc., at any of the addresses listed below:
PITTSBURGH 22, PA. . . . 3 Gateway Center
HAMMOND, IND. . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . . 1924 Broadway

CHEMICALS KAISER REFRACTORIES

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials • Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite

NOTHING *can equal Stainless Steel*

in its unique combination of properties

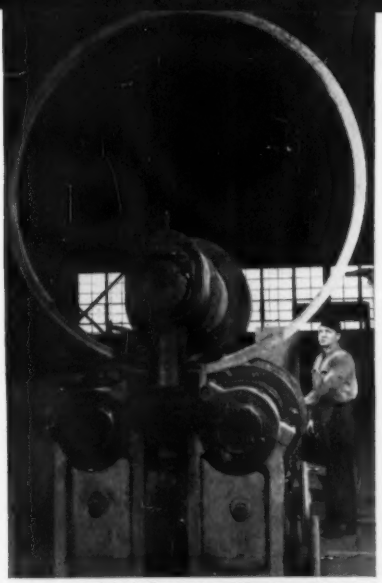
No other design material can match Stainless Steel in its unique combination of desirable properties: corrosion resistance, strength, hardness, beauty, cleanability and easy fabrication. If you're looking for a reliable source of supply, remember that United States Steel offers you the widest range of types, finishes and sizes.

UNITED STATES STEEL CORPORATION, PITTSBURGH
AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS • STRIP • PLATES • BARS • BILLETS
PIPE • TUBES • WIRE • SPECIAL SECTIONS

UNITED STATES STEEL



For Formability...

Jet engine and pressure vessel makers are using roll-formed rings in large numbers these days. Alloy Manufacturing Company in Pittsburgh is a major supplier of Stainless Steel fabricated parts, and they process this steel on ordinary "carbon steel rated" equipment without difficulty.

For Cleanliness...

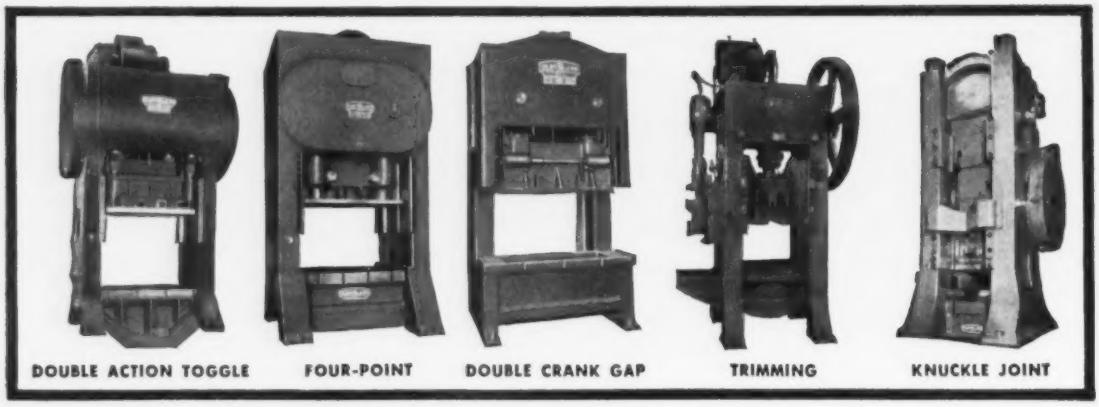
Bates Manufacturing Company, Lewiston, Maine, is a famous name in cotton goods. They used to have trouble with dyeing equipment; the iron vats held the old colors and "killed" new colors. With Stainless Steel dye kettles, old colors actually *rinse* out, without costly scrubbing.

For Style...

G & G Woodcraft, Dinette Division, in Detroit, is selling a handsome new dinette table, designed by Gelitis, with a polished Stainless Steel top. The top is backed with plywood, and there is no metallic sound when it is struck. Stainless is a perfect material for contemporary design, and it's so *practical.*

Cleveland Presses

help keep your plant competitive



If you do volume stamping, production-wise and cost-wise there's no better way to protect your competitive position than by prompt replacement of outmoded presses.

High stamping and maintenance costs are the penalty of inefficient press operation. Don't let them rob you of the cost of new, efficient presses.

Now's a good time to check your older press performance records. You may find that you're already paying for new presses . . . *without their benefits*. If so, you can make no better investment than the purchase of *new* Cleveland Presses equipped with the Cleveland (patented) Drum Type Clutch. Our engineers will gladly help you select the *right* Cleveland for your needs. Write or call today!

The CLEVELAND Punch & Shear Works Co.

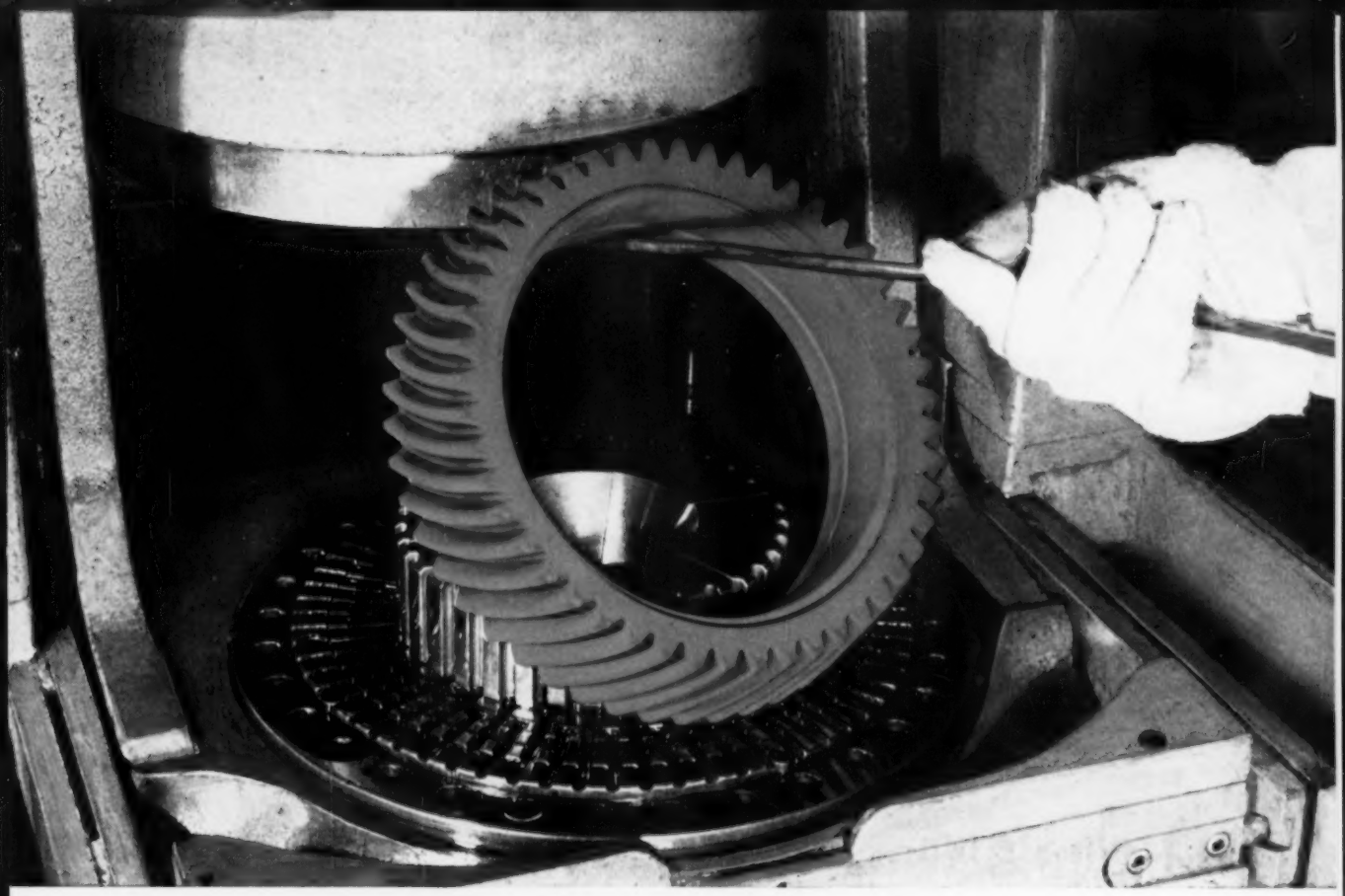
Power Presses • Fabricating Tools • Punching Tools and Dies

East 40th and St. Clair Avenue, Cleveland 14, Ohio

Offices at: New York • Chicago • Detroit • Philadelphia • East Lansing • Cincinnati

THE CLEVELAND PUNCH & SHEAR WORKS CO.

Established 1880



How to hold close tolerances when you quench gears and other parts

If you make parts like this aircraft transmission gear, you know that warpage or distortion during quenching means losing the time and money you've spent machining the part to close dimensional tolerances.

You can avoid such costly losses with Gleason Quenching Equipment.

The hot gear above, for example, is being set on the lower die of a Gleason Quenching Press. A button is pressed and the automatic quenching cycle is started. The lower die is swung back into the quenching position and the upper die descends rapidly, aligning the part while it is still in the plastic state.

The dies securely clamp the gear, but are so designed to permit it to contract in the normal manner, while still holding the gear true.

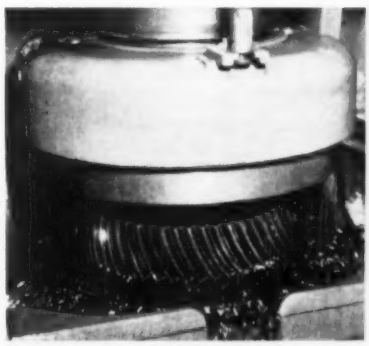
Carefully controlled, metallurgically correct oil circulation hardens the gear to perfection.

Post-quench tests show the gear meets all specifications.

You can give *any* part, regardless of shape, the same distortion-free quenching.

Three sizes of the Gleason Quenching Press harden parts up to 36″ diameter. Another press automatically hardens and straightens shafts and shaft parts up to 40″ in length.

For literature and recommendations on the press and die equipment that fit your products, send us blueprints.

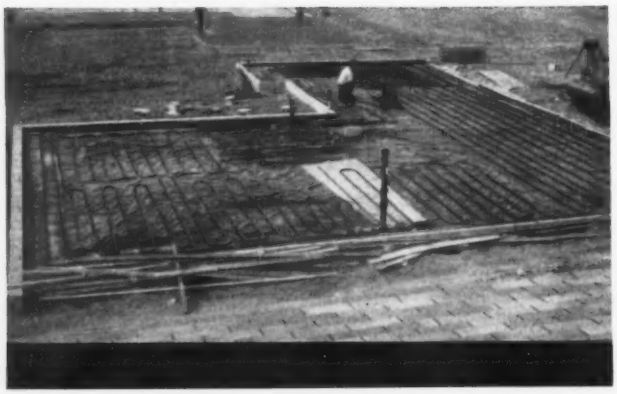


The Gleason Quenching Press forces oil uniformly over and around the part, assuring the correct hardness and distortion-free quenching.

GLEASON WORKS

Builders of bevel gear machinery for over 90 years

1000 UNIVERSITY AVE., ROCHESTER 3, N. Y.



Youngstown steel pipe

. . . Gives Long, Maintenance-Free Life to Radiant Heating Installations

Youngstown Steel Pipe was installed by National Heating Co. in this 60-unit development of Modern Builders, Inc., both of Cincinnati, Ohio.

Specify Youngstown and secure these 7 Points of uniform goodness

- uniform ductility
- uniform lengths
- uniform threading
- uniform weldability
- uniform wall thickness and size
- uniform strength and toughness
- uniform roundness and straightness

QUALITY YOUNGSTOWN SERVICE

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel

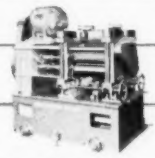
General Offices - Youngstown 1, Ohio

District Sales Offices in Principal Cities

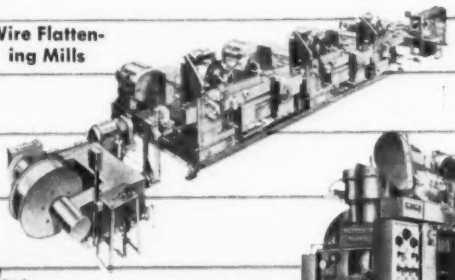
Modern residential developments—like this 60-unit project off Cincinnati's Winton Road—demand only the most modern heating facilities. So, to afford these new homeowners warm, draft-free rooms of equalized temperatures, invisible radiant heating systems utilizing Youngstown Steel Pipe were installed.

For years Youngstown Steel Pipe has been specified by leading architects as well as progressive plumbing and heating contractors for its dependability and long life. That's because it's made of only the finest steel by steelmen with over half-a-century of steelmaking knowhow. All Youngstown operations from ore mining to finish threading are closely quality-controlled to give you the best piece of pipe obtainable anywhere. Why not make Youngstown your specification for long, trouble-free installations?

For additional information or service, contact your local Youngstown distributor—or phone our nearest District Sales Office, today.

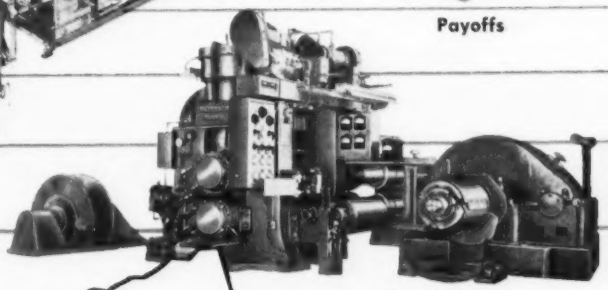


Coilers

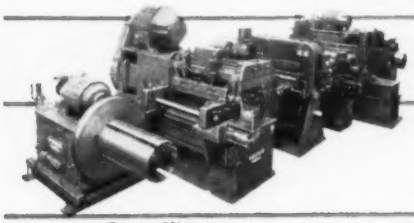


Wire Flattening Mills

Payoffs



Two High Strip Rolling Mills

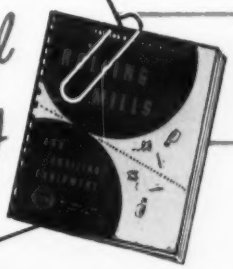


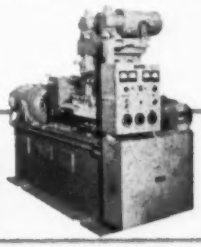
Gang Slitters

MEMO

Re Rolling Mill Modernization

Look Into Latest Waterbury Farrel Mill Machinery

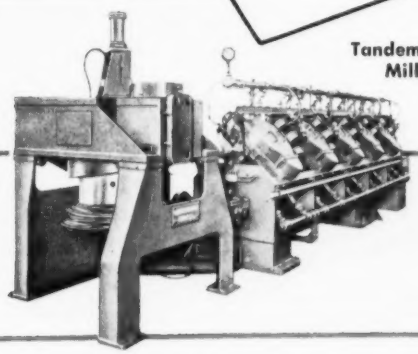




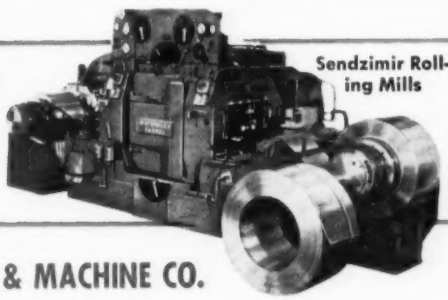
Four High Strip Rolling Mills

Coil Boxes

NEW, 48 PAGE MILL MACHINERY CATALOG.
Gives a complete picture of the various types of mills and auxiliary equipment built by Waterbury Farrel. Send for your copy, today.



Tandem Rod Mills



Sendzimir Rolling Mills

ROLLING MILL EQUIPMENT

- Four-High Rolling Mills
- Gang Slitters
- Grading Mills
- Mint Mills
- Sendzimir Rolling Mills
- Special Rolling Mills
- Two-High Rolling Mills

AUXILIARY EQUIPMENT

- Coil Boxes
- Coilers
- Coil Lifts and Transfers
- Belt Wrappers
- Edgers
- Handling Equipment
- Payoffs
- Straighteners
- Winders

ROD AND TUBE MILL EQUIPMENT

- Draw Benches
- Tandem Rod Mills
- Three-High Rod Mills
- Two-High Rod Mills

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Sales Offices: Chicago • Cleveland • Millburn, N. J.

Bolt, Nut & Screw Machinery

Power Presses

Rolling Mill Machinery

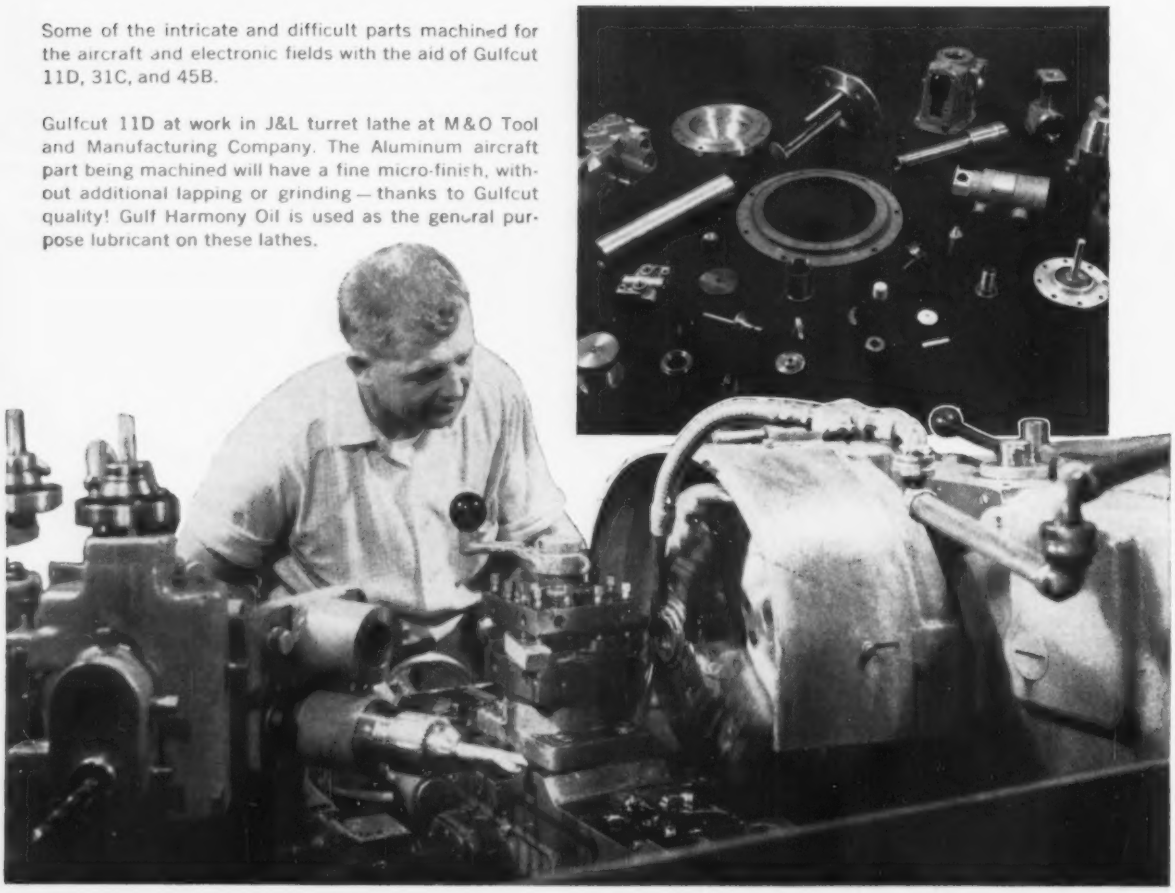
Wire Mill Equipment

Sendzimir Mills & Other Special Machinery

WF-31

Some of the intricate and difficult parts machined for the aircraft and electronic fields with the aid of Gulfcut 11D, 31C, and 45B.

Gulfcut 11D at work in J&L turret lathe at M&O Tool and Manufacturing Company. The Aluminum aircraft part being machined will have a fine micro-finish, without additional lapping or grinding — thanks to Gulfcut quality! Gulf Harmony Oil is used as the general purpose lubricant on these lathes.



"We like the tough machining jobs ...and do them with GULFCUT"

says M&O Tool and Manufacturing Company, Wallingford, Connecticut

"We like the intricate, difficult jobs," says Mr. William E. Maseychik, owner. And Gulfcut helps us turn them out . . . on schedule. On our type of precision work, cutting oils must have more than just excellent cooling properties. They must have outstanding anti-weld characteristics, and extreme load-carrying ability. We've used Gulfcut Oils since the day we opened, because Gulfcut does everything we require."

M&O Tool and Manufacturing Company gets increased tool life by using Gulfcut . . . and less built-up edge. Gulfcut helps them maintain fine finishes to tolerances of five ten-thousandths. "We hold such tolerances consistently on our Jones & Lamson turret lathes," says Mr. Maseychik, "on aluminum, titanium, monel, inconel, SAE steels, many grades of stainless. Gulfcut certainly plays a major part in the quality of our machining!"

Why not investigate the benefits of Gulfcut cutting oils in your shop? Just call your Gulf Sales Engineer. He's at your nearest Gulf office, ready to serve *you!*

GULF OIL CORPORATION
1822 Gulf Building
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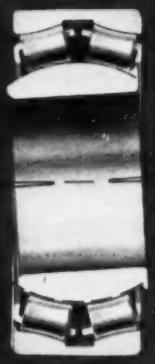
GULF

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

self-aligning . . . CAN'T BIND



HOW SELF-ALIGNMENT WORKS. Spherical inner ring, free to align in any direction, assures full load capacity regardless of shaft deflection or support misalignment.

Husky bearings in husky housings adjust immediately in any direction

When high-impact loads deal out punishment, shaft deflection may spell a quick finish for ordinary bearings. But this rugged Link-Belt bearing is *self*-aligning . . . won't "pinch" or bind when misaligned.

Complete protection is provided by effective seals which block entrance of dirt, escape of lubricant. Durable housing—machined as two perfectly matched parts provides easy installation without shims or alignment rings.

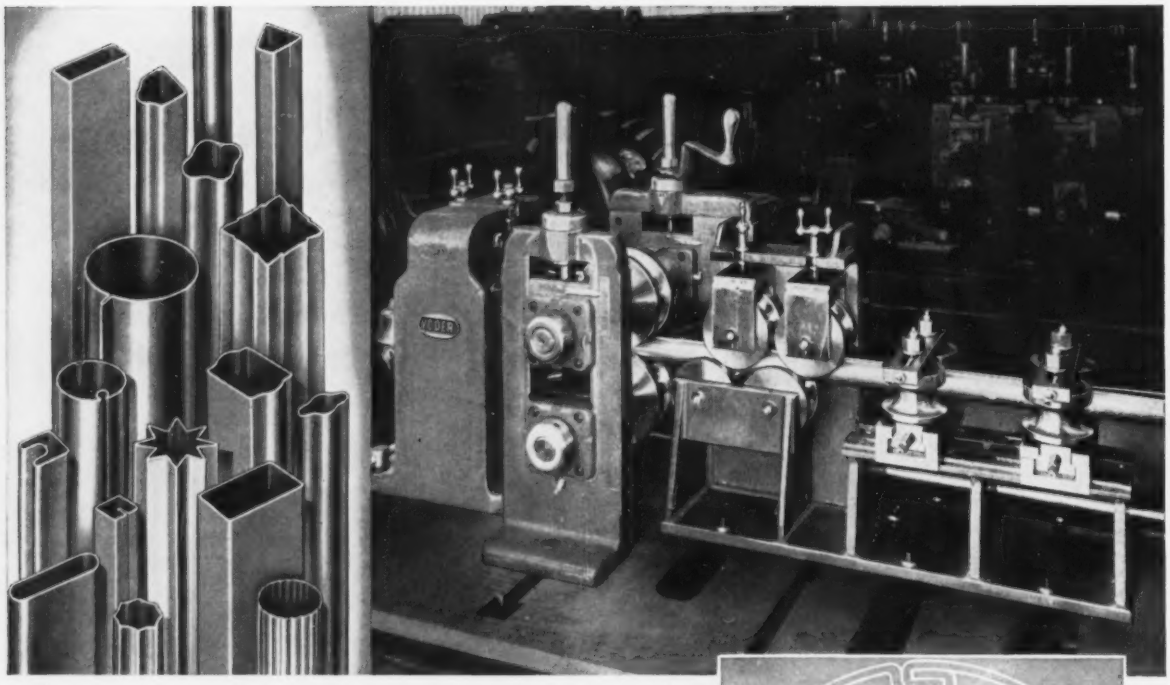
Get full data on Link-Belt's complete bearing line from Book 2550. Ask any of 40 Link-Belt offices or one of our authorized stock-carrying distributors.

Series 6800, 6900, 7800, 7900 roller bearings have internationally standardized boundary dimensions.

LINK-BELT

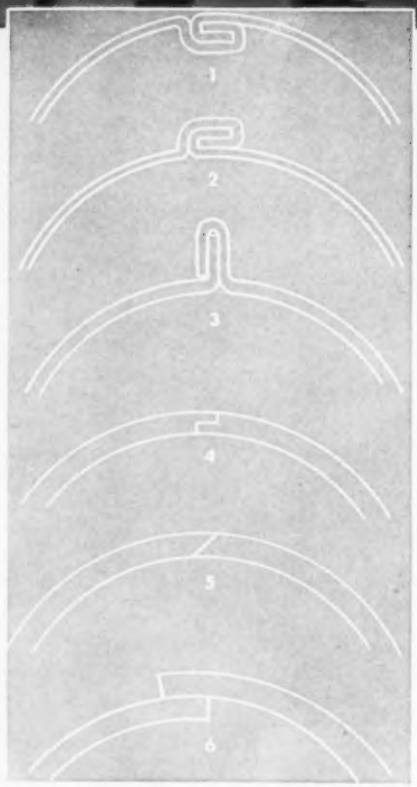
self-aligning ball and roller bearings

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.44"



Lock-Seaming attachment at exit end of forming machine.

COLD ROLL FORMING TUBULAR SHAPES



Among the wide variety of things you can make on a Yoder Cold Roll Forming machine are round, square, oval, rectangular and other tubular shapes, such as illustrated at left above. The seams may be open, lapped, butted, dovetailed, interlocking, etc.—as indicated in Figures 1 to 6 at the right.

Millions of feet of such unwelded tubular shapes are made from coiled strip for conductor pipe, bedsteads, lamp stands, window channel, wiring raceways, carrying rods, etc. Production ranges from 20,000 to 50,000 feet per day, with only one operator and a helper.

Yoder offers you the cooperation of their engineering staff for designing and adapting their cold roll forming machines, auxiliaries, and tooling, for the low cost production of structurals, mouldings and trim, panels, tubular and other shapes, to meet individual needs.

The Yoder book on Cold Roll Forming is a complete, illustrated text on the art and the equipment needed for performing a variety of operations which can be combined with cold roll forming, at little or no extra labor cost. A copy is yours for the asking.

THE YODER COMPANY
5510 Walworth Avenue **Cleveland 2, Ohio**

ENGINEERING **YODER** MANUFACTURING

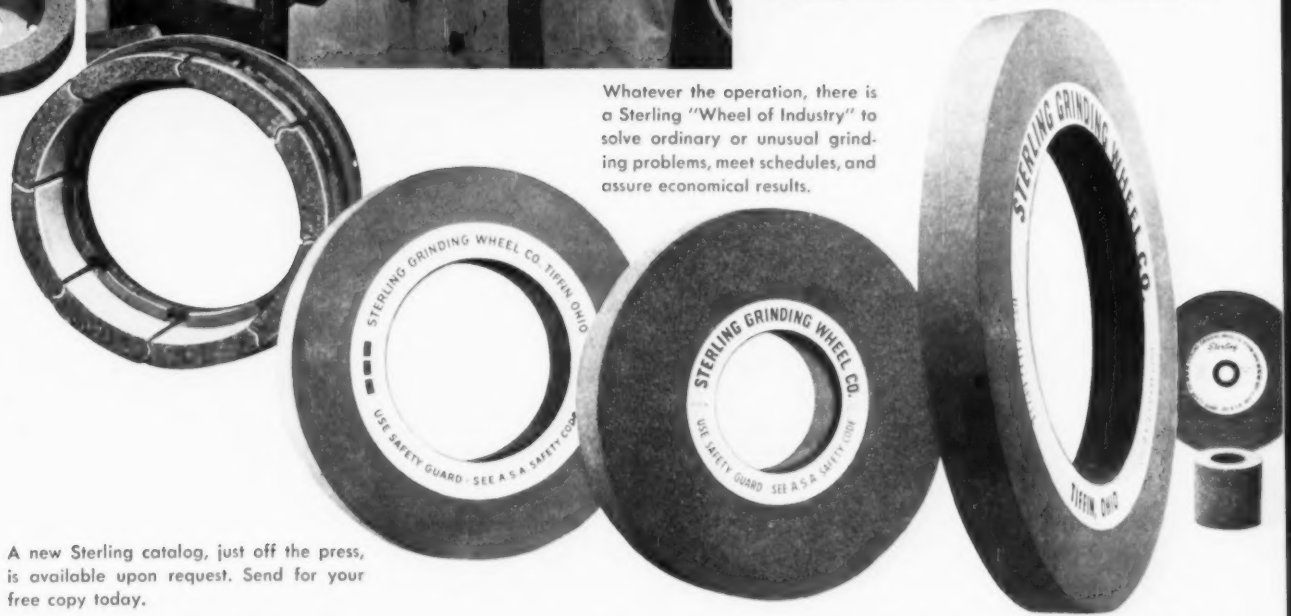
COLD ROLL FORMING MACHINES
PIPE AND TUBE MILLS (ferrous or non-ferrous)
ROTARY SLITTING LINES

Sterling's "sixth element" grinding wheels assure pre-determined job quality always

REALIZING it is the extras that produce the superior grinding wheel, Sterling now makes available a *sixth element* in every abrasive unit it creates. The five standard elements of a grinding wheel specification are abrasive grain, size, grade, structure, and bond. The *sixth element*, built into all Sterling "Wheels of Industry," is the human element.

The sixth element or *human* element takes into consideration the operator himself—what he expects from a grinding wheel, how he handles his machine, with what force he directs the wheel into the work and all the other personal factors that affect quality and performance. Sterling studies individual preferences in formulating the tailormade wheel for your job to produce better, more economical results *everytime!*

Sterling engineers and laboratory technicians, dedicated to meeting the personal needs and desires of the operator, naturally produce a better wheel—one that lowers costs, speeds up production, reduces worker fatigue and downtime, and stands up longer under unusual job demands. For application of Sterling's *sixth element* to your grinding problem, consultation is suggested with an experienced Sterling abrasives engineer or distributor.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STERLING GRINDING WHEEL CO.
TIFFIN, OHIO

Whatever the operation, there is a Sterling "Wheel of Industry" to solve ordinary or unusual grinding problems, meet schedules, and assure economical results.

A new Sterling catalog, just off the press, is available upon request. Send for your free copy today.

"Wheels of Industry"—Vitrified and Resinoid—provide the most economical and efficient method of metal removal.

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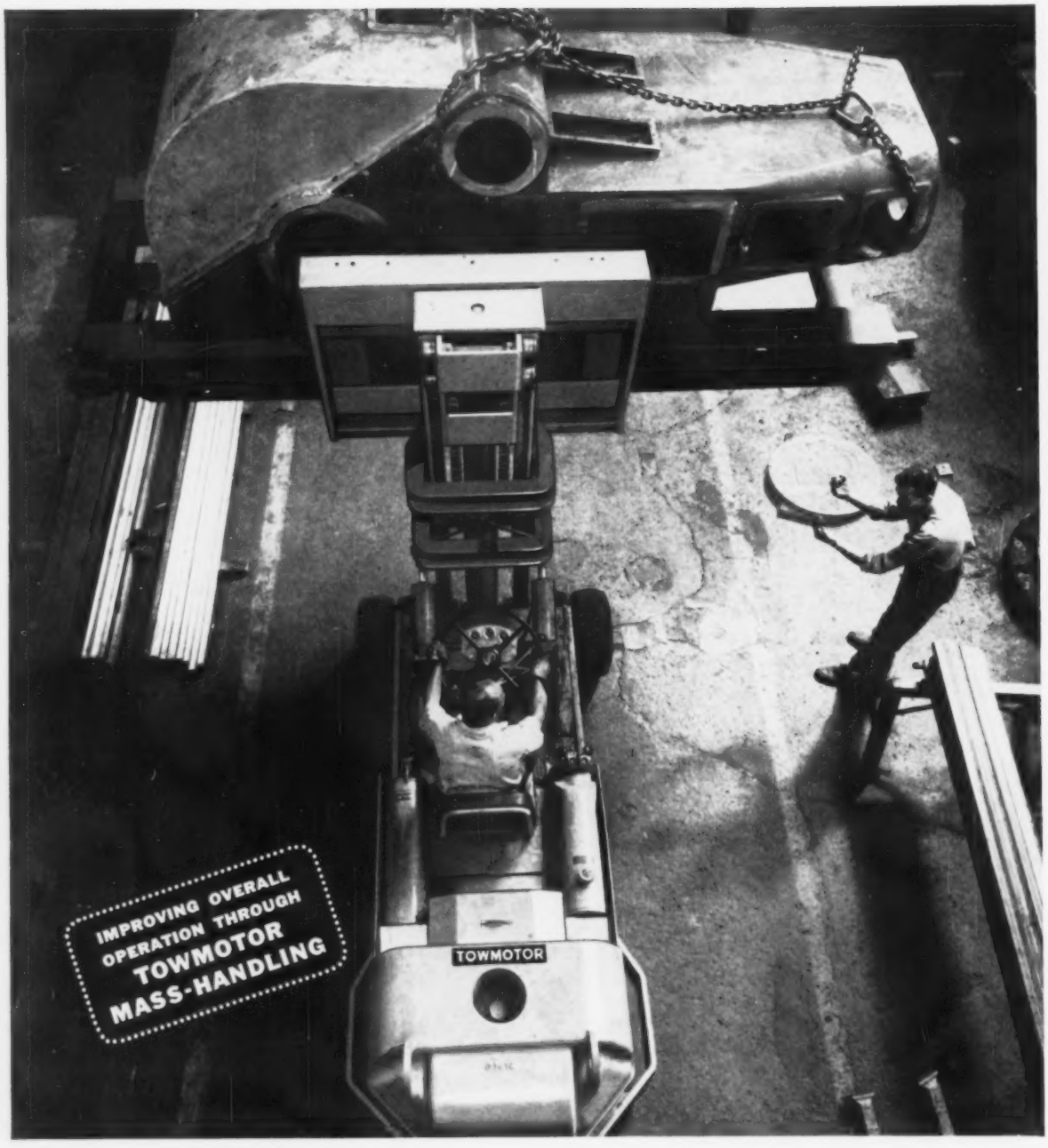
"THE WHEELS OF INDUSTRY" STERLING

STERLING GRINDING WHEEL CO., TIFFIN, OHIO—SUBSIDIARY OF ABRASIVE AND METAL PRODUCTS COMPANY

Distributors and Direct Representatives Located in All Principal Cities



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Management men in every industry are giving productivity and profits—*as well as personnel*—a lift by integrating Towmotor mass-handling in all operations from receiving to delivery.

Every department benefits. More work gets done. And you don't need more men to do it because Towmotor fork lift truck operators are finding it's *fun* to multiply the handling of materials aided by 12 new Towmotor improvements like these:

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Here's Why More H-P-Ms are Chosen for Shell Production than any other make of Press

H-P-M high explosive shell production know-how has been invaluable through three major emergencies and our preparedness program. Here's the proof ...the above photo shows models of H-P-M presses for two shell lines which will produce 8 inch high explosive shells at a large midwestern plant. And a line of five similar presses has been installed at another plant for the same job. These are the only two major facility contracts placed for shells in the past two years. The presses, tooling and engineering planning are H-P-M standards—standards that the Ordnance Industry team accepts with complete confidence assured through hundreds of successful installations.

Shell manufacture is only one of the important jobs for which H-P-M presses are so widely accepted throughout the metalworking industry. If you have a problem concerned with the forming of metal, complete H-P-M engineering service is available for planning and follow through. For complete information, write or call us today.

The H-P-M 1000-ton press used in hot piercing high explosive 8 inch shells, the first operation in the hot forging, cold extrusion process used in shell manufacture.

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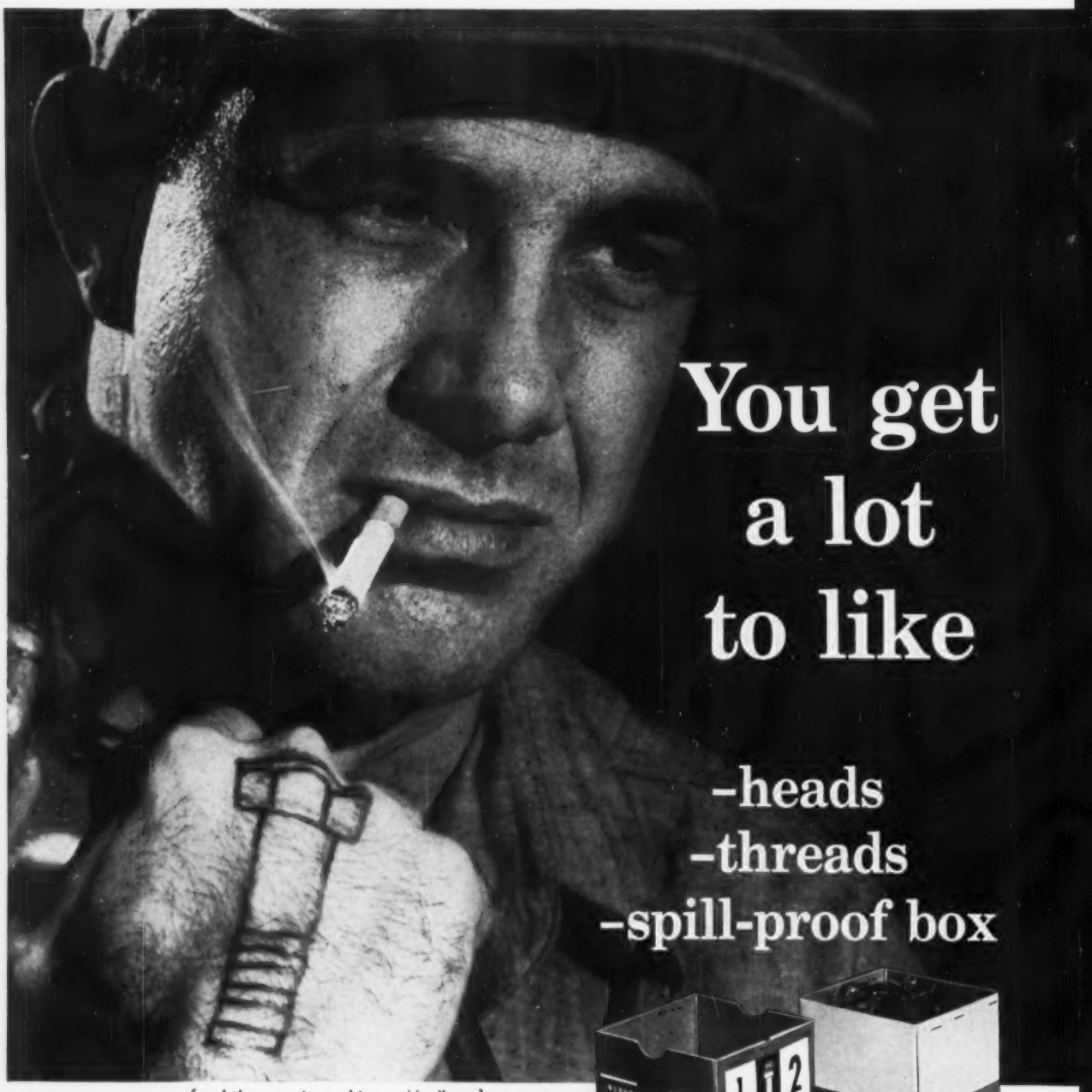

You get a lot to like

-heads
-threads
-spill-proof box

(and the man is smoking a Marlboro)

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World's Widest Range of Standard Steels

Attention to Detail Makes Republic Your Best Fastener Choice

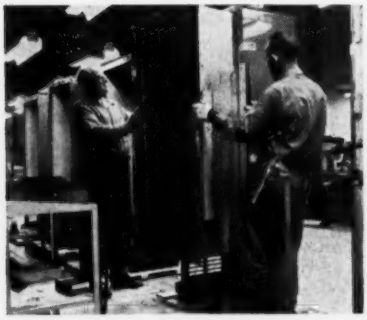
In any assembly, production costs and product performance depend directly on the quality of fasteners used to hold it together. And when you specify Republic Bolts and Nuts, you get attention to detail that goes far beyond simply meeting established industry standards.

To begin with, Republic is in complete control of the material used in fastener manufacture. From ore mining through steelmaking to completed product, metallurgical and mechanical testing assure substantial margins of safety in final fastener performance.

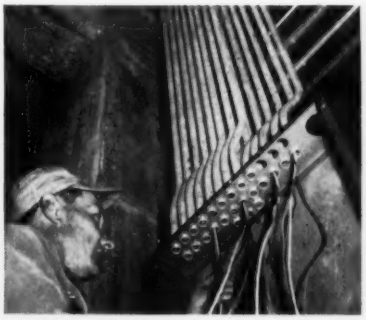
Further, the machines used in bolt and nut forming and threading are periodically checked for accuracy. You get clean full-depth threads, and true, full-size heads for trouble-free wrenching and maximum holding power.

Finally, Republic's inverted package design, plus high-visibility labels, simplify handling and inventory problems.

So don't just order fasteners, *select* Republic and be sure of the best. Over 20,000 standard and 8000 special types and sizes are available. Send coupon for full information.



YOUR BEST CHOICE OF STEEL SHEETS, in terms of your production and application requirements, is Republic. For example, the corrosion resistant zinc surface on Republic Continuous Galvanized Sheet won't crack, flake or peel under the most severe forming operations. Republic ENDURO® Stainless Steel provides easy workability plus lifetime beauty. Republic Electro Paintlok® provides an excellent paint base, and retards corrosion even if the surface is scratched through. For details on these and other sheet products, send coupon.



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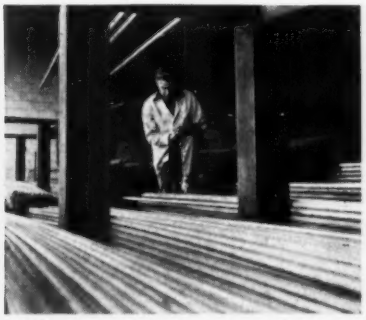

CHOOSE REPUBLIC STEEL PIPE for all of your assemblies requiring ease of installation and dependable operation. Formed by continuous butt welding of uniform flat rolled steel, Republic Steel Pipe provides good concentricity for accurate threading and joining. Uniform ductility assures smooth bends. Welding characteristics are unsurpassed. Pipe walls are galvanized for protection inside and out. Republic Steel Pipe is available in all popular sizes. Contact your Republic representative, or mail coupon, for data.

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STUPALOX

Sintered Oxide

CUTTING TOOLS

OUTPERFORM OTHER CUTTING TOOLS TWO TO TEN TIMES!

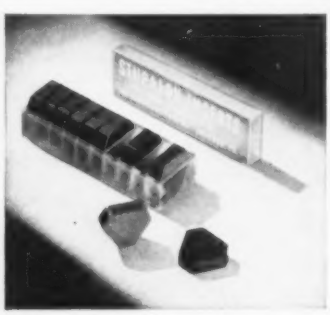
Deeper cuts, faster speeds, greater hourly production, machining the "unmachinable"—these are typical results discovered in scores of tests of STUPALOX versus other cutting tool materials.

Comparative performance studies of various tools in production shops, under normal operating conditions, brought out the relative abilities of each material. In these tests, STUPALOX outperformed other tools TWO TO TEN TIMES! In many cases, the full potentialities of STUPALOX could not be realized because of the limitations of power, or the rigidity of the machines in which the tests were performed.

As a direct result of these tests, a number of companies have already standardized on Stupalox tools, with gratifying improvements in machining costs and production.

Stupalox tools are available in several styles and sizes of inserts, and in commercial quantities. We will be glad to send you specific information on experiences with Stupalox for machining a wide variety of ferrous and non-ferrous metals.

HANDY PACKAGE...
This compact plastic box contains ten Stupalox sintered oxide tool inserts.



STUPAKOFF DIVISION OF
The CARBORUNDUM Company
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MUNDT

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Sixty-seven years of manufacturing perforated metals for every conceivable purpose assure satisfaction.

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Stops Losses making Dies and Templates

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END NIGHT CLEANUP & MORNING REBLUING

DYKEM HI-SPOT BLUE No. 107 is used to locate high spots when scraping bearing surfaces. As it does not dry, it remains in condition on work indefinitely, saving scraper's time. Intensely blue, smooth paste spreads thin, transfers clearly. No grit; noninjurious to metal. Uniform. Available in collapsible tubes of three sizes. Order from your supplier. Write for free sample tube on company letterhead.

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ARMSTRONG *Drop Forged* HOIST HOOKS

Correctly engineered, drop forged and heat treated. Strong—max. load is 4 times rated "safe work load"; elastic limit approximately twice rated load. Inside hook sizes from ¾" to 4". Capacities ½ to 25 tons. For safe dependable service . . . specify ARMSTRONG Hoist Hooks. Write for Catalog.

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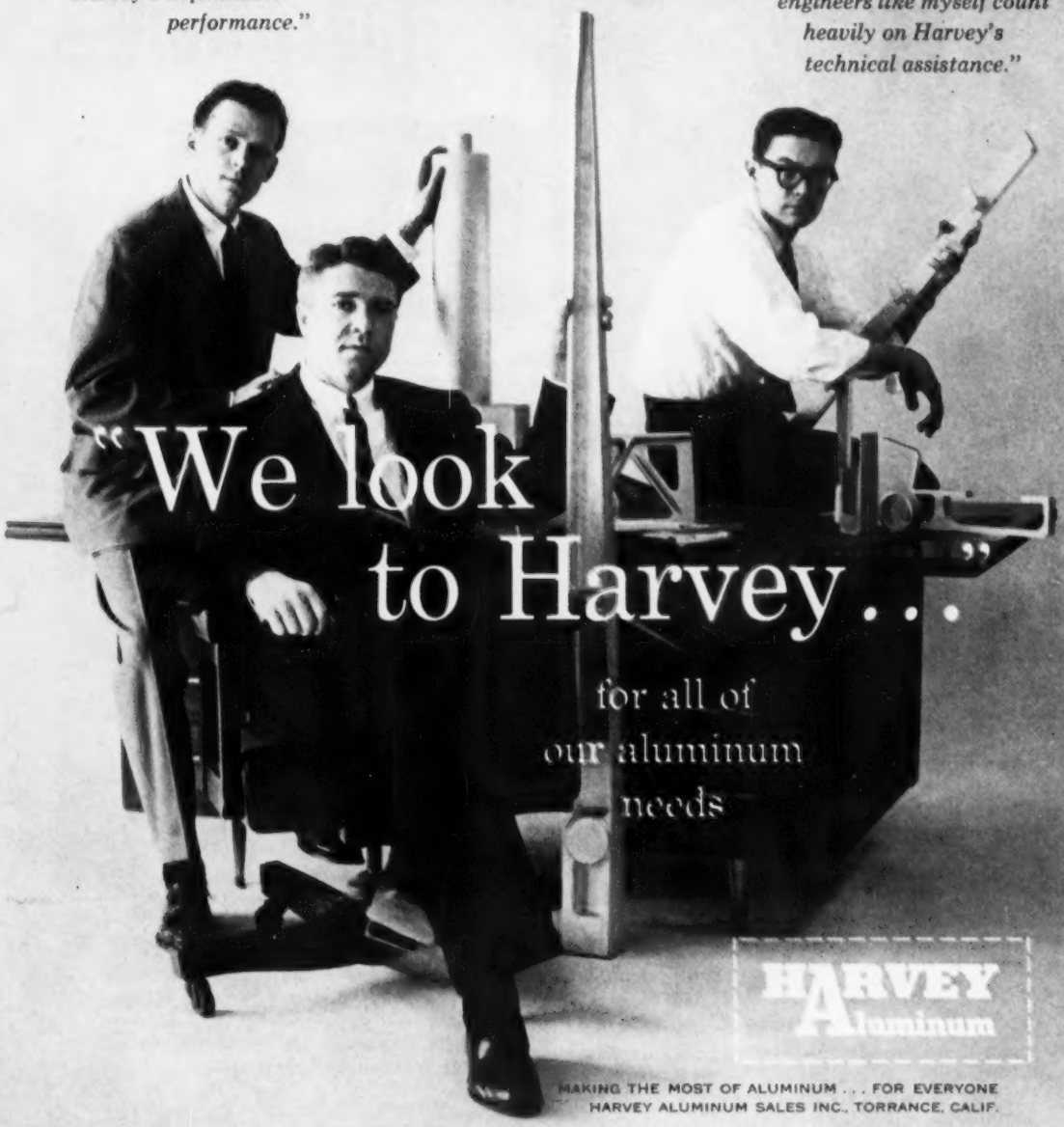

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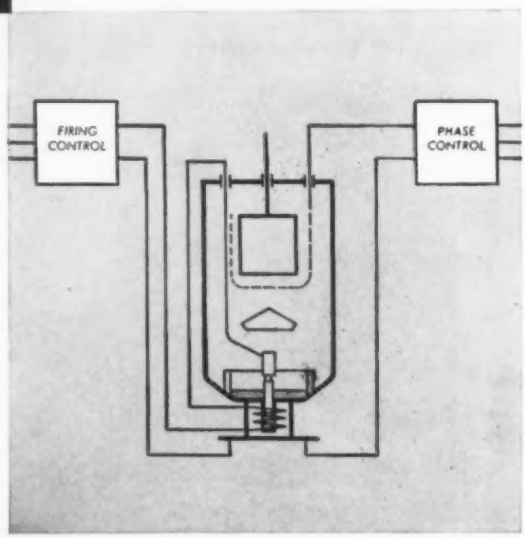

Only Excitron Rectifiers Provide Separate Circuits

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Foreign Mills Want Pig

Pig iron producers are being pushed hard by foreign steel mills for export tonnage. Inquries come from Bolivia, Argentina, West Germany and other countries. Japan is particularly active. According to one producer, domestic demand is still too strong to permit full development of overseas business.

Plastics in Autos

Plastics generally have failed to win too many important victories as an automotive material. But two recent developments may have important significance. Informed sources say plastic horns will definitely be used on some 1958 models. Another application where plastics are battling metal is on gasoline lines.

Keep Eye on Coal Pipeline

Pipeline transmission of coal between Pittsburgh Consolidation Coal Co. and Cleveland Electric Illuminating Co. is being studied with increased care by other potential users. Preliminary reports suggest that the economies of this unusual method of coal transport for long-haul distances may exceed first expectations. The coal moves in a water suspension through a 10.75-in. OD pipeline, at below-frostline levels and over grades not exceeding 10°.

Fatigue Findings

Shedding new light on the subject of brittle fracture of steels, a recent report makes the startling claim that the cleanest steels aren't always the best in fatigue. As for the part played by inclusions, sulphide inclusions are not as harmful as silicate inclusions. No direct relationship can be established between notched-bar impact results and those obtained from fatigue tests.

Titanium Progress Report

Titanium sheet alloys with strengths 30 to 50 pct greater than previous alloys are closer to commercial production. Defense Dept. reports that—under its titanium sheet rolling program—commercial size ingots have been melted and three producers have begun production of sheet. Highest target priorities call for heat-treated alloys with room-temperature ultimate tensile strengths of up to 180,000 psi, yield strengths of 160,000 psi. Short-time ultimate strengths to 130,000 psi at 800°F are expected.

Finishes In Velvet

Artificial velvet-like finishes in patterned or overall-coated form are produced with a British electrostatic machine. Process works with almost any surface of any shape. Flock fibers deposit on the desired surface electrostatically, oriented parallel to each other, end-ways to the surface. An adhesive grips them to produce an actual rug-like "pile" effect. Fibers acquire their charge from contact with a metal mesh, plate or wires of high dc potential with respect to parts to be finished.

Risk in Mixing Greases

Use mixed greases, and you chance having your equipment fail. So warns an Army research report. The safest bet is to avoid mixtures of different greases. If this isn't possible, next best plan is to run compatibility tests under simulated operating conditions to make sure blend's okay.

Stepped-Up Patent Service

Congress plans to spend more money to speed patent service. Some inventors may stop trying rather than wait two-to-three years for a patent, the law-givers fear. This year they'll give the Patent Office at least the $19.2 million it asks in new funds. Meanwhile, the agency expects a slight drop in its stock of patent applications—from 217,000 last June to probable 208,000 by this June 30.

Heating For Forging?

Does "fast heating" for forging steel have any harmful effects? A recent test program tends to prove the direct opposite. Not only does fast heating greatly reduce scaling, but it also permits the use of lower forging temperatures. Lower temperatures, in turn, have a beneficial effect in that they virtually eliminate grain growth.

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We'll ship TIMKEN® 52100 steel tubing from warehouse stock within 24 hours after we get your order!

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HAVE
WHITE COLLAR WORKERS
LOST
FRINGE BENEFIT
ADVANTAGE?

Pct of workers covered, 1953-54	OFFICE	PLANT
PAID VACATIONS:		
One week after one year	99	99
Two weeks after one year	83	26
Two weeks after five years	99	95
PAID HOLIDAYS:		
Six days per year	97	89
Seven days per year	65	42
Eight days per year	46	19
INSURANCE:		
Life	91	89
Accidental death or dismemberment	40	45
Sickness and accident	45	65
Hospitalization	73	80
Surgical	70	76
PENSIONS:	71	56
SICK LEAVE ON FULL PAY:	44	14

Source: Bureau of Labor Statistics

Brace for White Collar Drive

Your white collar workers are ripe for union organization. And labor is going after them.

But that's only one of the labor problems facing top management — By George S. Odiorne.

■ Organized labor is casting a covetous eye in the direction of industry's white collar workers. They comprise a juicy plum in the area of the unorganized—and labor is stepping up its recruiting efforts.

The big weapons at the disposal of the unions include (1) today's slim wage gap between factory and office, and (2) fear of displacement through office automation.

The Pitch—The aggressive United Steel Workers union is playing the automation theme to the hilt. Howard Hague, union vice president, is in charge of the drive to organize office and technical workers within the union's jurisdiction.

A conference of AFL-CIO unions indicates that the drive for white collar unionism will stress the low pay of office workers compared with the men in the shop, and compare present-day conditions with the office worker's former status in the wage hierarchy.

What To Expect—Some features to watch in this drive:

White collar workers in plant offices will get immediate attention, since they have closest contact with unionized workers of all the white collar ranks.

Engineers, some making up to five figures annually, are joining unions. One estimate is that one of

How White Collar, Production Wages Compare

Average Weekly Income 1954

WHITE COLLAR		PRODUCTION	
Professional, technical	$ 94.32	Metalworking machinery	92.87
Managers, officials or proprietors	100.65	Transportation equipment	86.67
Clerical workers	71.83	Engines and turbines	86.05
Craftsmen, foremen	81.65	Steel mills	83.38
Sales workers	73.52	Primary aluminum	85.05
Operatives	64.40	Motors, generators	82.82

Sources: U. S. Bureau of Census and Bureau of Labor Statistics

every 10 engineers is now a member of a collective bargaining unit.

Automation through the use of Integrated Data Processing equipment and computers is being used to create a desire for the security of union membership.

The narrowing wage gap between factory and office is being pointed to as a reason for white collar workers signing a petition for a bargaining unit.

What To Do—Here's what management is doing in the face of this drive:

Salaries of white collar workers are improving in an attempt to eliminate some of the gap.

Office managers are being briefed on unionism, how it comes about, and how to behave in the face of an organization drive.

More attention to good supervision in the office is taking the form of training programs in supervision and human relations for chief clerks and office managers.

Problems Ahead—The stepped-up drive to organize the white collar workers is just one reason why your labor relations men will be in no position to take it easy this year or next—even in those industries where the long-term contract eliminates the need for heavy negotiating.

Here are some other reasons:

Your skill as a contract administrator will be on the line in such areas as arbitration, grievance handling, communicating your story to employees and supervisors.

Set Your Sights—You have time, and a need, to take a long range look ahead in labor relations. You'll have to set policies that carry your company toward these goals. This will take some solid research in industrial relations, and systematic training of your managers at all levels.

A good foreman will be worth his weight in dollars. All of the gains you made in bargaining are going to go down the drain if your foreman isn't executing the contract properly. Furthermore, you probably can't hire one away from anyone else for your business. You'll have to take the present one and improve his performance. This doesn't mean just a few conferences on the contract. It means that he has to be a pretty good manager in every respect.

Nip Trouble Early—Arbitration as the last step in the grievance procedure is now part of nine out of ten labor contracts. With a good foreman as the first step, and arbitration as a last one, the mechanics are available to keep your plant free of gripes and dissatisfaction, or to thrash out the really tough ones without undue bitterness or delay.

Settle as many grievances as possible at the lowest level, preferably at the foreman level. When they travel upwards in the chain they acquire overtones of "principle" and face-saving that cost time and money.

Be Prepared—Preparation is the big shortcoming of most company cases, say experienced arbitrators. Facts are not dug out completely; cases are not prepared in keeping with the basic rules of evidence that convince arbitrators; and briefs and documents are sketchy or inconclusive.

Some companies "role-play" the arbitration in advance to foresee the problems in the hearing, and to

. . . ABOUT THE AUTHOR

George S. Odiorne is personnel division manager for American Management Assn. Earlier, he was in charge of executive development at Rutgers University. He has had 10 years' production experience in industry.

find the loopholes in their preparation before going to the hearing.

Research — Industrial relations research is increasing. There is an association of experts in this field, and the type of information of practical value is increasing.

Planning Tools — Some long-range information that should enter into an employer's planning would include:

Labor Market Information—The availability of skilled and unskilled labor, what labor problems other industries are encountering, etc.

General Economic Data—Industry growth, forecasting data which might have a bearing upon industrial relations policy in future contract planning, or wage re-openers.

Employee Attitude Studies—Sensing the morale and general cooperativeness of the work force, and if possible how it is affecting contract administration. It also has some valuable uses in preparing supervisory training program.

Management Techniques — The effect of certain managerial policies and the practices of management can be appraised as a basis for supervisory and executive development.

Speak Up — Throughout this process of steering clear of the shoals ahead, it becomes more important than ever to take a second look at the communications in your organization. Getting "the word" to everyone and having them accept it and behave in a productive fashion will take more than a little skill and effort.

Workers and supervisors want to know what is expected of them and how they are doing. Policy and procedure decisions have to be passed all the way down.

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Illness Costs Industry $2 Billion A Year

Hitting hard at older, more experienced workers, illness-absenteeism is a drag on every production line.

Study shows there's no easy solution to the problem.

▪ Industry loses almost $2 billion worth of production time each year due to employee illness and absence from the job. The loss to the workers themselves is about $800 million in wages, around 13 pct of their annual income.

These facts were disclosed as the result of a five-year investigation into prolonged illness-absenteeism in industry by the Research Council for Economic Security, Chicago.

In a book giving the results of the study the Council declares, "The nation cannot continue to prosper . . . if it cannot alleviate the economic burden of illness, particularly the losses arising from long-term illness."

The Big No—"It is not likely that any of these problems can find a permanent solution through the application of technical formulas and programs. Introducing catastrophic illness coverage with a $500 exemption, increasing Blue Cross benefits to 120 days and more, setting up special committees to study extended illness, are steps in the right direction."

"But only too often the steps lead into a blind alley where a presumedly realistic attitude (expense is too high, risk is too great, time is not ripe, industry is not ready) vetoes further advance."

Findings of the study show prolonged illness-absence is:

Greater among women workers than among men.

Found more in production workers than in salaried personnel.

Higher among older workers.

Best Workers Lost—"From this," the study says, "we can conclude that production lines are hardest hit; that experienced workers, in whom there is an investment in training and whose skills can least be spared, are more frequently absent."

The estimated cost of prolonged illness to workers, except those on farms, are:

More than $1 billion paid out in sickness compensation and paid sick leave.

Medical costs of $700 million, of which $266 million represents medical payments by workers.

A production loss amounting to the work of 453,000 men for a full year.

A total of over 2 million cases of prolonged illness-absence occur every year.

Dispensary Lag — The study points out, in considering diagnosis and treatment of worker illness, that the "company medical department might have played an important role in making early diagnosis, counselling with the employee, advising and assisting him in securing competent medical care, consulting with the attending physician."

It was revealed:

Only about 41 pct of the 145 firms studied had physicians on their staff.

Only 14.5 pct had a full-time medical man.

About 36 pct of the companies had some sort of facilities for diagnostic tests in their medical departments.

"This (situation) is one of the gaps in our program of action that could be filled readily," the study indicates.

Signs of Easing in Structurals

Premium Brokers Sing a Different Tune

For users of structurals and heavy plate, an almost forgotten feeling is returning.

They're beginning to feel assured they can get the items they need in reasonable time.

Purchasing agents are taking the pressure off suppliers.— By G. J. McManus.

■ For the first time in two years, buyers of plates and structurals are feeling a little comfortable and even a little confident. This feeling is not universal but there are signs that it is fairly widespread.

"In the past 10 days, no one's been trying to take steel away from us," says a warehouse that specializes in plates and structurals.

"We don't have to battle the mills for our tonnage anymore," says the purchasing agent for a heavy equipment maker. "And we're not getting calls from our plants every day to help them out of steel pinches."

Prices Drop—Most significant of all, perhaps, the brokers of premium steel are running for cover. With purchasing agents balking at high prices, plate and structural listings have fallen off sharply. And with pressure to unload increasing, prices are sinking fast. Where plate was commanding prices of 12¢ and 14¢ per pound a short while back, it is now being offered for less than 10¢ a pound.

What's behind all these signs of plenty? Has the supply of heavy steel really caught up with demand? Or are users doing some wishful thinking that could kick back hard?

Forces At Work—Sifting out the facts from the talk, the picture looks something like this: Shipments of plates and structurals have jumped significantly. The new-found confidence of fabricators and others has tended to loosen supply channels. There are a few local, and probably temporary, lags in demand.

Light plates and structurals are a lot more plentiful. Heavy plates and structurals are a little more plentiful but are still very tight. Users may see daylight but they're not out of the woods by any means.

Biggest factor in the change has been increased mill output. In the first two months of 1957, the mills shipped over 1 million tons of structural steel. This compares with less than 900,000 tons during the same period last year. Plate shipments topped 1.5 million tons in January and February, as against less than 1.3 million tons in the first two months of last year.

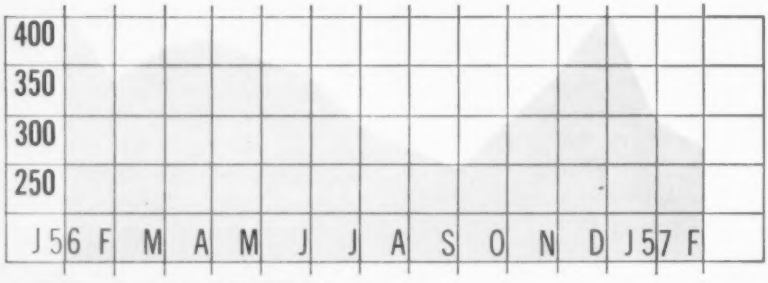
Light Items Gain—Biggest part of the gain has been in lighter products. Most major producers are now rolling plate on strip mills. This has made for an ample supply of plate under ⅜ in. in thickness and under 100 in. in width. Smaller structurals are likewise being pushed by producers who normally emphasize flat - rolled products. Jones & Laughlin is operating at capacity on a mill that is rated at 300,000 tons annually and turns out special beams up to 12 in., standard channels up to 6 in.

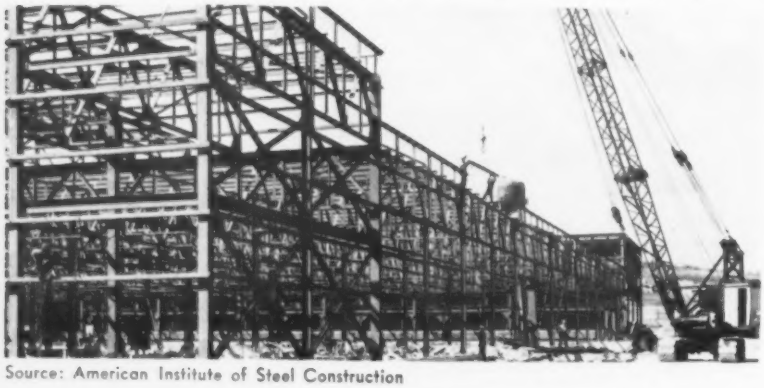
Weirton Steel has stepped up output of structural facilities rated at 200,000 tons annually. Making wide flange beams up to 14 in., Weirton is selling outside today, where in the past it has often needed full production for home construction.

Bar Mills Pitch In—Elsewhere bar mills are reportedly being put

Orders for Structurals Drop

Bookings of Fabricated Structural Steel (thousands of net tons)





Source: American Institute of Steel Construction

to work on smaller structurals. At any rate the supply of structurals under 8 in. has improved.

Production of heavy structurals and plates has also increased. Additional steel ingots, diverted from slack sheet operations, have helped a little although most heavy mills have been working close to capacity right along. At least two of the big plate producers are rolling light gages on strip mills. This has freed plate mills for heavy gage work.

Wishful Thinking? — On the psychological factors involved, the effects can't be measured.

"We can't see any reason for holding onto surplus steel," said one fabricator. "We can replace in a reasonable time at a reasonable price. The mills are doing better on delivery promises. You can figure on delivery within two weeks of the due date."

"I wish it were true," said a mill spokesman. "We're trying but for heavy plates and structurals, two-weeks delay is still wishful thinking."

Some plate and structural users endorse this view heartily. They have felt little or no improvement in supply or delivery.

Tax Relief, Maybe

Smaller firms may yet win some tax relief this year, through a liberalizing of accounting rules.

Permission for small firms to accelerate depreciation of used machinery is one of several relief areas now under consideration in House and Senate Committees. Others deal with more liberal rules on losses incurred on investments, long-term payment of inheritance taxes, and the option for small corporations to be taxed as individuals or partnerships.

Grass Roots Pressure—There is no guarantee that any of the four tax "breaks" will be enacted into law this year. Strong pressure from "grass roots" small business firms could force action, however.

Plans involving rate cuts are postponed until 1958.

Justice Asks Quick Knockout

Government proposes to kill Bethlehem - Youngstown merger in a hurry.

But chances for a handsdown victory are considered slim.

▪ The Government proposes to block the planned merger of Bethlehem Steel Co. and Youngstown Sheet & Tube Co. without a lot of fuss and feathers.

It would do this by means of a "summary judgment" from Federal District Court, New York, which would dispose of the case without written opinion or trial. Allen Dobey, Justice Dept. attorney, revealed the Government's plan at a pre-trial hearing before Federal Judge Edward Weinfeld.

What It Means—Attorneys say a summary judgment usually is requested where one side or the other believes it has a clear-cut case. In the Bethlehem-Youngstown action, the Government's proposed move is believed to be more or less of a formality in view of the magnitude and complexity of the case.

The Government's chance of winning without a trial is slim.

Brownell Approves — Attorney Dobey indicated the Justice Dept. would file its motion for a summary judgment within 30 days. He said Attorney General Herbert Brownell approved of the proposed strategy. The Government will have 30 days to submit evidence.

Congress Drags Feet On Antitrust

Congress is getting off to a delayed start in its drive to tighten the antitrust laws.

Last year, the politicians predicted 1957 would be a year crammed with enactment of tough new laws against monopoly.

It could still happen, but the prospect lessens with each week.

Reasons Why—The slow pace of antitrust activity is due to several reasons. For one thing, many congressmen are deeply preoccupied with the sensational labor scandals and ways to cure the evils now coming to light. For another, there are wide differences of opinion within Congress as to how monopoly trends can effectively be thwarted without causing more harm than good.

Legislation requiring that firms planning to merge notify the Government in advance has finally been approved by a House judiciary subcommittee, following almost two years of study.

Proposed Law—The House bill would require 60 days advance notice to the Government of proposed mergers if the firms involved have combined assets exceeding $10 million. Small stock acquisitions are exempted.

To meet criticisms against the pre-merger principle, the new bill places a strict prohibition against disclosure of information in the merger notice, imposing a $5,000 fine on government employees who violate the order.

Exemptions — The bill exempts purchases of undeveloped mining and timberlands and bank mergers.

A pre-merger notification bill passed the House last year, but got lost in the last minute Senate shuffle. The bill can get an earlier start this year. Both parties last year pledged tougher antitrust legislation.

While the lawmakers study methods of tightening the antitrust laws, the Government trustbusters have been stepping up their activities under existing legislation.

Investments Widen Their World

Nonferrous Firms Expand Portfolios

Trend to broaden holdings among nonferrous companies leads to strange corporate bedfellows.

All in all, the field was profitable last year. But record year is unlikely to be repeated in 1957.

▪ They didn't make much noise about it, but many primary nonferrous producers expanded programs of "diversification by investment" in 1956. It made for some strange bedfellows.

For instance, Kennecott Copper upped its investment in Quebec Iron and Titanium Corp. by $3.9 million in 1956 to a total of $41.4 million. The copper company now has two-thirds control. New Jersey Zinc Co. owns the other third. But almost 10 pct of New Jersey Zinc belongs to Phelps Dodge, one of Kennecott's competitors. Phelps Dodge paid $10.3 million for this stock in 1956.

Major Partner — Phelps Dodge also owns 16 pct of Southern Peru Copper Co. Investment to date has been over $8.7 million, most of it in 1956. Major partner in this venture is American Smelting and Refining Co., which owns 57.75 pct, representing over $23.4 milion.

Cerro de Pasco Corp. also owns 16 pct of Southern Peru. American Smelting and Refining owns 14.4 pct of Cerro de Pasco, in addition to 1.2 pct of Kennecott Copper.

The Biggest — Most impressive portfolio listed in annual reports of ten of the leading nonferrous producers belongs to Kennecott Copper—over $119 million, up $9.5 million, including stock of Kaiser Aluminum and Molybdenum Corp. of America. In addition, Kennecott will put up $20 million for 50 pct of a new titanium company.

American Smelting and Refining has over $64 million invested, including 35.8 pct of Revere Copper and Brass, and 34.6 pct of General Cable Corp.

Record Earnings—Business was good for primary nonferrous producers in 1956. Eight of them made more money than in 1955. And seven of these registered new all-time highs. One of the two companies losing ground says 1956 earnings were still the second best in history.

Outlook for 1957: Soft spots. Some companies say outright they will not do as well in 1957.

Says Anaconda: ". . . we can not anticipate that earnings . . . for 1957 will approach the record levels of the past two years."

St. Joseph Lead hedges: ". . . we can only do our best to adjust to (cheaper imports) and protect ourselves."

Price Factor . . . Record earnings were reported by the Big Three copper companies despite a shaky sales picture. The reason: High copper prices. Lower prices along with leaner ores will affect the profit picture in 1957.

The two companies that made less in 1956 than in '55 are producers of lead and zinc. The industry is having trouble with imports. Foreign producers upped shipments to the U. S. by 24.7 pct in 1956.

Price Supports — Price supports by the government stockpile program helped the industry, but St. Joseph Lead says it benefitted foreign producers as much or more.

Both aluminum and nickel are pushing expansion.

Expansion Details—Alcoa upped primary capacity by 54,000 tons in 1956. This year the company will spend a big chunk of a $600 million appropriation.

Reynolds will finish the new 112,500-ton reduction plant at Listerhill, Ala., and begin a 100,000-ton plant in New York.

Kaiser is in the midst of a $300 million project.

According to Annual Reports—

	Net Earnings		Production (tons)	
	1956	1955	1956	1955
Kennecott	$143,154,000*	$125,516,000	582,205	526,715
Anaconda	$111,502,358*	$ 65,256,306	477,099	437,855
Phelps Dodge	$ 86,975,682*	$ 72,319,224	270,181	259,977
Alcoa	$ 89,621,033*	$ 87,600,808	756,000	702,000
Reynolds	$ 41,239,902*	$ 34,306,521	426,907	428,900
Kaiser	$ 42,349,000*	$ 36,021,000	434,730	406,000
Asarco	$ 39,826,820	$ 33,529,094	(L) 506,626	459,789
			(Z) 197,553	186,436
St. Joseph	$ 10,291,357	$ 12,729,820	(L) 137,429	138,796
			(Z) 136,879	138,201
N. J. Zinc	$ 2,570,650	$ 4,826,284	Not Reported	Not Reported
Inco	$ 96,296,000*	$ 91,566,000	143,000†	145,000†

* All-time high. (L) Lead. (Z) Zinc. † Deliveries.

Memory of '54 Haunts Producers Of Cold-Rolled Strip

Sales are off, but nothing like the 40 pct dropoff in 1954 from 53's top year.

Inventory cut-backs have already been completed. Mills are on short delivery, but most reliable customers are active.—By K. W. Bennett.

▪ Is cold-rolled strip slipping into another 1954? Strip salesmen still shudder when they recall the 40 pct slump in shipments from 1953 to that year.

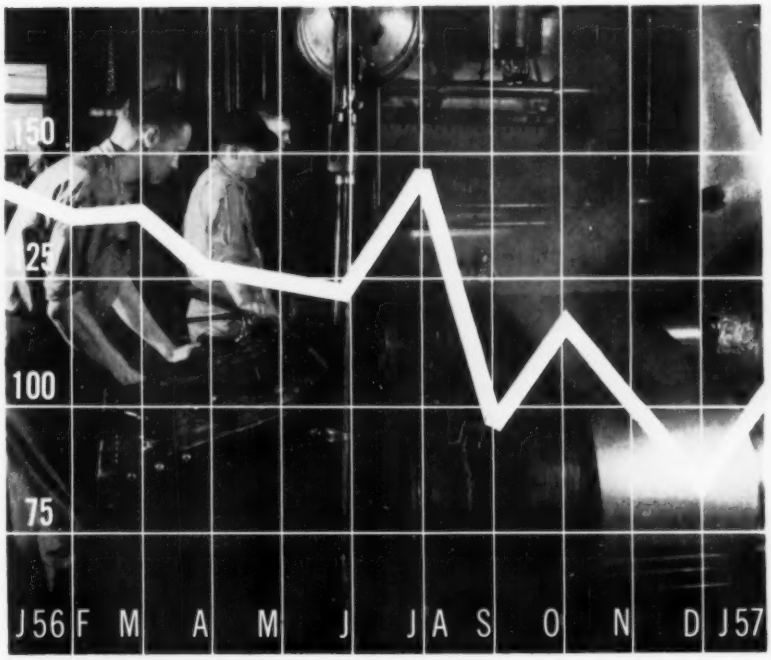
Under pressure, they admit a probable drop in 1957, but not more than 10 pct under the 1,545,120 net tons shipped in 1956.

At the moment, this requires real faith. February shipments are estimated to have fallen 10 pct below January. It is freely forecast the industry will drop another 10 pct in March. At the moment, 1957 shipments are behind the 1954 figure.

Not All Bad—But there's life in cold-rolled strip yet. Consumer inventories have been cut back. Total steel shipments have fallen at an average rate of 2.5 pct since last October, but cold-rolled strip users have cut back at a faster rate, very nearly four pct. Following the strike in July and August of 1956, cold-rolled strip shipments, including carbon, alloy and stainless, hit a second half peak of only 135,183 tons last October. In 1955 there were only two months when cold-rolled strip hit a figure that low—during the July vacation period and in January.

The 20 pct rise over December in January of this year was no stunner either. It is the lowest January shipment figure since 1954, and is only 1000 tons over the shipment figure then.

Shipments in thousands of net tons. Carbon only.



What's Ahead for Cold-Rolled Strip?

Deliver from Stock—The result is already apparent. Mills are asked for cold-rolled strip on 3 to 4-week delivery, and deliveries are being made in as little as 15 days where mills can deliver stock from their own inventories.

There is little reserve at the warehouse level. Unlike most grades of steel, cold-rolled strip is carried by only a fraction of the total warehouse industry. Of the major warehouses which do handle the grade, one told THE IRON AGE: "We had an increase in strip business in January and February. The real drop didn't come until April. But we're certainly not heavy on the grade. We reduced stocks during January-February upswing. Now, we're coasting."

Second Quarter Hopes — Strip customarily shows a late second quarter spurt. A few observers already point out that May and June hot strip mill space is being booked for light plate, that there will be less hot strip space available should a sudden need for cold-rolled strip arise.

Another point in strip's favor. It is tied less closely with the auto industry, where buying continues down, than its sister grade, cold-rolled sheet. In 1955, for example, nearly half of cold-rolled sheet production went into the auto market, as compared with about one-third of cold-rolled strip output.

Market Rundown — Roughly, automotive takes one-third of strip output; building products one-tenth; electrical machinery and appliances about 8 pct each; containers, 7-8 pct;

general commercial and domestic equipment, 10-12 pct. It's increasingly uncommon to see cold-rolled strip lose a customer to slit sheet. Most of the users who could use sheet rather than the more highly finished strip have made the switch.

Hard core of this continuing strip market still centers around automotive, but includes: business machines, typewriters, electrical and electronic communications equipment, small and large appliances, outboard motors, toys, ball bearing fixtures, furniture manufacturers who use cold-strip fashioned to mechanical tubing with a No. 2 finish for plating, platers who require a No. 3 finish, steel strapping producers, electrical machinery, hand tools, some aircraft applications.

You never know. One excellent account for the salesman who garnered it was a whisk broom producer who needed strip for the plated caps on the handles of his homely helper. He bought strip. In tonnage lots, and every month.

Not Like '54 — The forecaster who compares 1957 with 1954, strip men say, is forgetting the inventory picture. The inventories accumulated in the roaring strip production year of 1953 haunted salesmen all through 1954. By contrast, second half 1956 saw drastic inventory cuts in cold-rolled strip, accentuated by the loss of much strip output during the steel strike.

Even Acme, largest U. S. producer and an independent unaffected directly by the strike, dropped to 50 pct of capacity for lack of raw materials from primary steel producers.

Some Good Signs—There's life in this product yet—considerably more than current shipment statistics would indicate. At least two of the seven largest cold-strip producers held a relatively high production level even into March.

The big bugaboo of 1954, excessive inventory, has already been dealt crippling blows. From now on, cold-rolled strip business depends strictly on the business levels.

Can Efficiency Finance Air Conditioning?

(Annual costs per sq ft to own and operate a building)

	INDUSTRIAL BUILDING		OFFICE BUILDING	
	New	Existing	New	Existing
Salaries and Benefits	$36.10	$36.10	$66.00	$66.00
Equipment and Supplies	$ 7.05	$ 7.05	$ 2.00	$ 2.00
Building Costs	$ 1.83	$ 1.29	$ 3.03	$ 2.68
Complete Air Conditioning	$ 0.47	$ 0.58	$ 0.53	$ 0.65
EFFICIENCY IMPROVEMENT REQUIRED	1.3 pct	1.6 pct	0.95 pct	0.99 pct

How to Pay for Air Conditioning

A problem in installing air conditioning is justifying its cost.

This survey gives an idea of how much increased productivity is needed to pay for it.

▪ Just how much must worker efficiency increase to pay for air conditioning your plant or office building?

This is usually the key question asked in making the decision of whether to air condition or not. And, just as frequently, answers are inconclusive.

Survey Results — A nationwide survey conducted by the Minneapolis - Honeywell Regulator Co. with the assistance of Carrier Corp. sought to determine, first, cost per sq ft to own and operate an air conditioning system, second, how much efficiency increase is needed to pay for installation of air conditioning.

According to John E. Haines, Minneapolis-Honeywell vice president, the survey shows worker efficiency must increase only slightly in order for complete year-round air conditioning to pay for itself in office buildings, factories and commercial air conditioning.

Less Than 1 Pct—Mr. Haines says the survey indicates that a system would be amortized in 20 years if worker efficiency increased .95 pct in the average new office building; .99 pct in an existing office building; 1.3 pct in a new industrial building; 1.6 pct in an existing industrial building.

The survey compares the cost of owning and operating a complete air conditioning system with other annual operating expenses in the typical building.

Mr. Haines points out that there are no existing nationwide studies to indicate how much worker efficiency and productivity increases with installation of air conditioning. But many examples are cited, including a 51 pct increase in efficiency in a Detroit Edison Co. drafting room.

Nation Warms Up to Heat Pumps

Industrial and Home Unit Sales Climb

The ingenious heat pump, which extracts heat from water or air, is gaining acceptance.

Purchase price is still high but operating costs are well below conventional heaters.

Many major appliance makers are already producing them—By G. G. Carr.

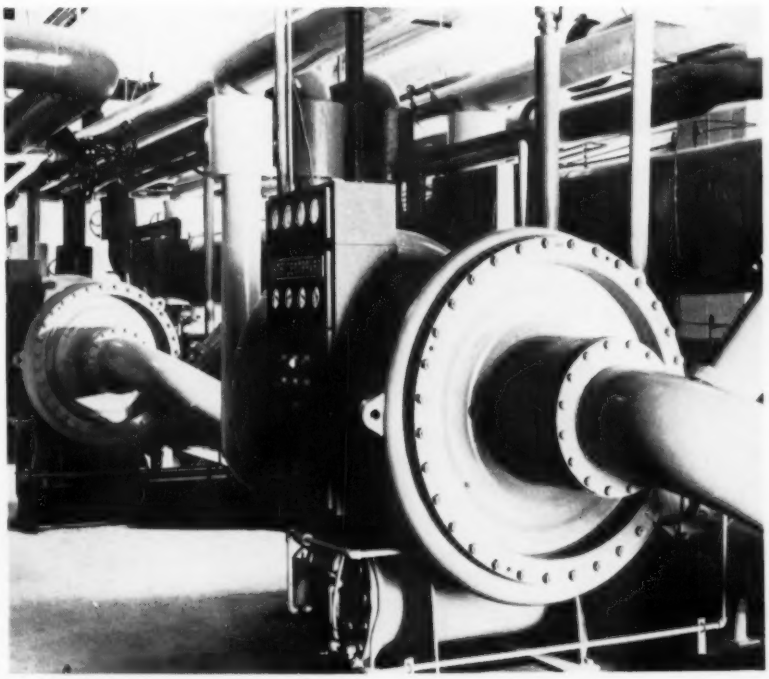
■ The heat pump keeps on warming up new evidence of its versatility and practicality.

Several important new industrial and commercial applications have recently been announced, and new cost and operating data are bringing a re-examination of some widely held beliefs.

Below freezing outdoor temperatures are proving no problem to a well-designed system. At American Coil Co.'s Farmingdale, N. J., plant, the water-to-air heat pump system this winter maintained plant temperatures at the normal 70-72 throughout a 6° cold snap without difficulty. And operating costs are reported well below those of conventional heating systems.

Using Own Units—Since American Coil Co. makes packaged heat pumps and air conditioners as part of a diversified line of heat transfer equipment, it was natural for the firm to study the feasibility of a plant unit. For its 63,000-sq ft plant and office building, the company installed 14 packaged water-to-air heat pumps, with aggregate horsepower of 123.

Operating costs are estimated to be about 25 pct under regular plant heating costs, including manpower and maintenance savings. Cost of digging a well, for example, was under that of building a chimney. Another advantage of the packaged unit system is its flexibility; when the office force works late, it's not necessary to heat or cool the whole plant.



ON THE RECORD: A year's successful operation has been reported for Trane Co.'s Tacoma City Light Dept. heat pump installation. Shown here are two 150-hp hermetic centrifugal compressors, heart of the unit.

Warm At 10 Below—The heat pump is moving into colder areas once considered out of its effective range.

A large manufacturing company is giving serious consideration to a 250-ton York compound compressor heat pump for a new office building in Buffalo, N. Y. This is perhaps the coldest climate ever considered for a major heat pump installation. THE IRON AGE learned that approval is expected in the near future.

The Trane Co. has reported a year's successful operation of one of its water-source pumps in the administration building of Tacoma's City Light Dept.

How about the market? About 7000 heat pumps of all kinds were sold last year, and some industry executives expect this to drop off to about 5500 this year. But optimistic estimates run as high as 200,000 units by 1965 with a value of $350 million.

Home Sales Grow—A substantial number of these will be home units. General Electric, Westinghouse, Carrier, and several leading makers are currently marketing packaged units for home use. Others have models on the drawing boards.

Initial cost of the heat pump is usually higher than for conventional home heating and cooling equipment. But this gap is closing through technical improvements. Savings through mass production will close it even further.

Steep Rock Mine: Ready by '60

■ The gigantic task of dredging 180 million cu yd of glacial mud and rock from the bottom of Ontario's Steep Rock Lake is on schedule.

At stake is a 53 pct hematite iron ore body of 50 million tons. Inland Steel Co. expects to meet its deadline of summer 1960, for first shipments of ore.

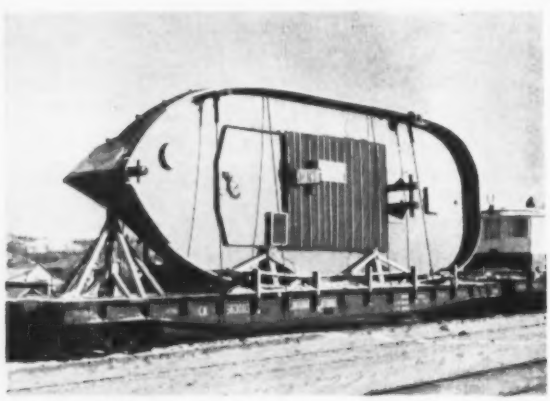
The ore will move 140 miles down a Canadian National Railways' spur to Port Arthur for lake shipment to Chicago. By April 1, contractors had moved 60 million cu yd of lake bottom. Pay dirt will appear this summer. Temperatures as low as —64°F were encountered in year-round operation.

PROGRESS REPORT: Original water line of Steep Rock Lake can be seen high above present lake level. Pipelines cross lake's surface to shore.

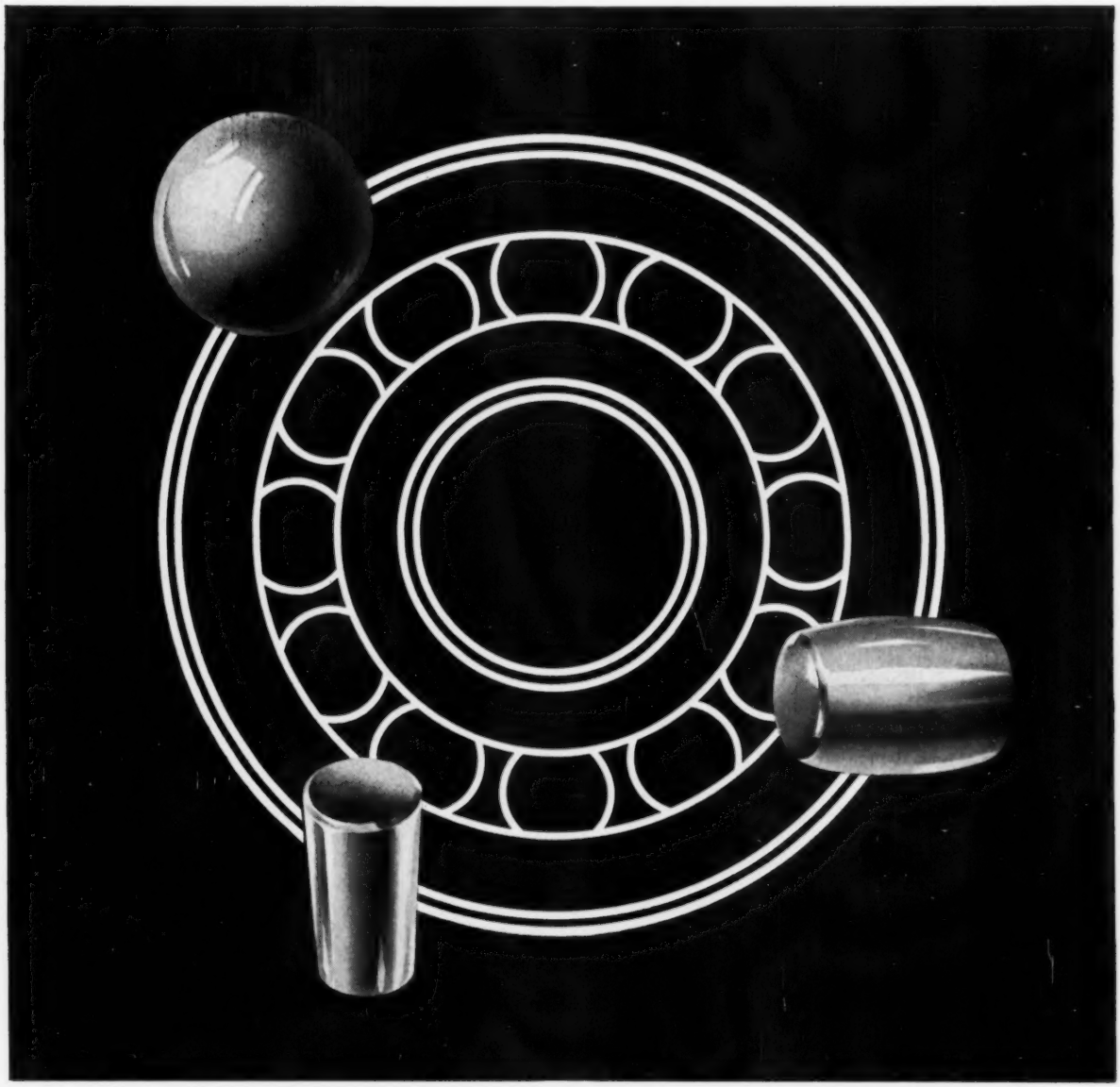
PUMPING POWER: 10,000 hp booster pump sends silt and boulders through pipe to nearby deposit lake.

PORTAGE: Twin 42-in. diameter pipes are powered by total of 30,000 hp from dredges and booster barges.

END OF LINE: Engineers check discharge flow. Lake will retain water level, but will be more shallow.



BIG LOAD: Before spur is completed, equipment like this is transshipped by trail to mine site.



cut bearing maintenance . . . with one lubricant

Nebula EP – another first for Esso Research – is a multi-purpose grease that *out-performs* all other multi-purpose greases. And many specialized greases as well!

Nebula EP works exceptionally well in ball, tapered roller and roller bearings – of *all sizes* from rolling mills to precision instruments.

Nebula EP stands up under extreme heat. It retains its lubricating qualities at high temperatures at which many special heat-resistant greases would have broken down.

And Nebula EP has exceptional water-resistant and rust-preventive properties – an important consideration where water is a factor. What's more, Nebula EP is formulated with a true soap which gives it extra anti-wear and load-carrying characteristics – for an extra margin of protection. High oxidation stability gives Nebula EP longer life in storage and in use.

Nebula EP can be applied by *any* of the conventional methods. Get the whole story about this fine product . . . from your nearest Esso Standard Oil Company Division Office: Boston; Pelham, N. Y.; Elizabeth, N. J.; Bala-Cynwyd, Pa.; Baltimore; Richmond; Charlotte; Columbia, S. C.; Memphis; New Orleans.

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PETROLEUM PRODUCTS

Forecast for Steel: Close to Record

That's the opinion of U.S. Steel's Bay Estes. He predicts '57 will be record year for steel industry.

However, dip in production can be expected during the second half.

■ The current year should be a record one for the steel industry and for the economy as a whole. That's the opinion of Bay E. Estes, Jr., Director, Staff Administration, U. S. Steel Corp.

"However," he adds in a recent speech to the Charge Account Bankers Assn. Conference, "before the year is over, we do anticipate a temporary slowing down of the growth rate of the economy, and an actual decline in certain segments of it, including steel production."

"This all adds up to a good year, but one in which alertness for change is vital. The factors to watch most carefully in your evaluation of what is happening and going to happen are the international situation, the credit situation, and business spending, both for plant and equipment and for inventories."

Output Equal to '55—Estes predicts that steel production in 1957 will be approximately 117 million ingot tons, equalling the record output of 1955. He also foresees an operating rate of close to 90 pct of the industry's expanded capacity.

Anticipating a period of coming inventory depletion he states, "After the steel strike of last summer, with a resultant inventory slash of six to seven million tons of finished steel products, inventory building was resumed again. This is continuing through the early months of 1957 and, together with peak steel usage, has kept the industry's operating rate at a high level—over 95 pct—during the first quarter of 1957. However, we believe this period of inventory building will be succeeded by an offsetting amount of depletion in the second half of 1957."

"Because of the lessening in steel demand occasioned by this change from inventory accumulation to inventory reduction, we anticipate a lower rate of ingot production in late 1957 than during the first quarter, although steel consumption will still be strong."

CHEMICAL BOWL: Hercules Powder Co. will store two million gallons of highly corrosive ammonium nitrate in this stadium-like reservoir near Richmond, Calif. Western Steel Div., U. S. Steel, installed 60 tons of 14 gage, 304 stainless steel to line the 200 ft diam, 15 ft deep tank.

Ike Asks Congress To Spare SBA

The Eisenhower Administration is urging Congress to make the Small Business Administration permanent.

SBA can provide "insurance" that small business will participate fully in the large-scale activity of government, the Administration says.

Deadline—The agency, to die on June 30 unless extended or made permanent, is the successor to the old Reconstruction Finance Corp. SBA makes loans to small firms, and assists them in securing government contracts.

The SBA is needed as a policy advisor to government on matters affecting small business, the Administration adds. Conditions that created the need for the agency are not temporary.

Congress Willing—A host of bills have been introduced in Congress to give SBA permanent status. Most recent is one by Sen. Edward J. Thye (R., Minn.), which would also authorize it to borrow funds from the Treasury Department for loans needed for small business.

OHIO SEAMLESS TUBING

SPEEDS UP DRILLING 25%

Pennsylvania Drilling Company, Pittsburgh, manufactures drilling equipment for foundation testing, mineral prospecting and other drilling, boring and sampling operations. Recently they introduced a new Flush-Joint Drive Casing made from cold drawn OSTUCO Seamless Steel Tubing.

The new casing stepped up overall drilling progress 25%—driving and pulling is easier and quicker. Flush-Joint Casings are stronger, too—actually 50% less breakage . . . with resultant savings in downtime, repair and material costs. Success with the new casing led to its incorporation in Penndrill's newly-designed Testborer which augers, automatically samples and drives and core drills.

There's a good chance OSTUCO Tubing components can improve the performance of your product. You can start the process by contacting the nearest Ohio Seamless sales office, or by writing direct to the Shelby factory.

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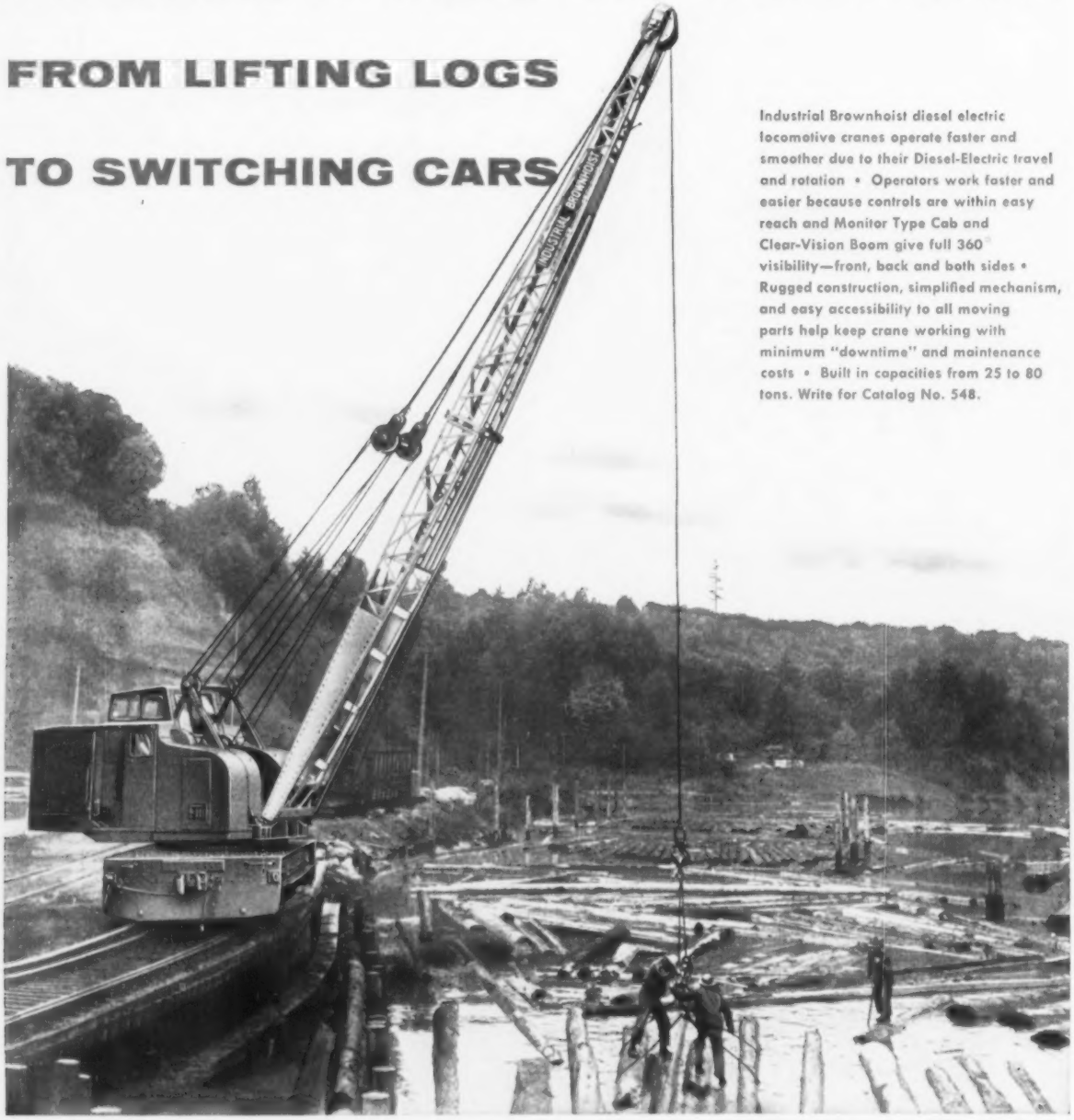
WHY INDUSTRIAL BROWNHOIST LOCOMOTIVE CRANES SPEED UP JOBS FROM LIFTING LOGS TO SWITCHING CARS

Industrial Brownhoist diesel electric locomotive cranes operate faster and smoother due to their Diesel-Electric travel and rotation • Operators work faster and easier because controls are within easy reach and Monitor Type Cab and Clear-Vision Boom give full 360° visibility—front, back and both sides • Rugged construction, simplified mechanism, and easy accessibility to all moving parts help keep crane working with minimum "downtime" and maintenance costs • Built in capacities from 25 to 80 tons. Write for Catalog No. 548.



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199

Peter E. Rentschler

Your Competition Can Like You

Keeping ahead of competitors without incurring ill feelings takes a lot of doing.

This foundryman has earned the respect of his industry by using his time and energy wisely.

His activities spread into social organizations, education and politics.

Peter E. Rentschler: A businessman should work for his industry.

■ The only living foundryman who holds both the Gold Medal from the Gray Iron Founders' Society and the Peter L. Simpson Gold Medal from the American Foundrymen's Society did not come by his recognition easily.

To Peter E. Rentschler, president of Hamilton Foundry & Machine Co., Hamilton, O., the foundry business is a "dog-eat-dog business where competition is rougher than in any other industry."

Works In Groups—While carrying on hard-hitting business tactics for 38 years, he made such valuable industry contributions that he was given unanimous acclaim by his competitors. You can't say that about many businessmen.

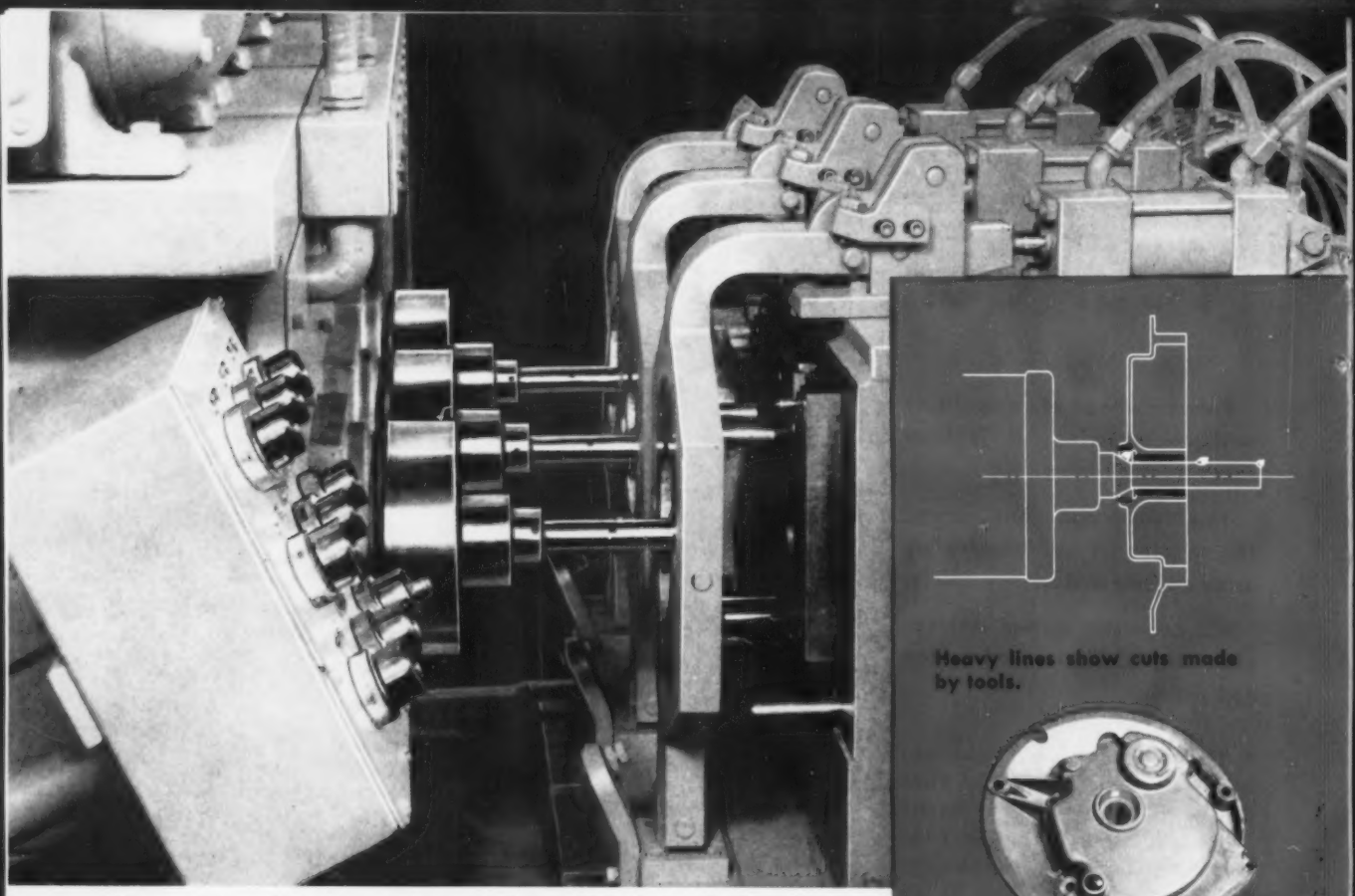
Some of his activities: member of the Committee for Uniform Cost and Estimating Systems for Gray Iron Foundries in 1934; member of the U. S. Munitions Board Advisory Subcommittee on Gray Iron Castings; active in organizing the Foundry Educational Foundation; former president and director of the Gray Iron Founders' Society; chairman of the Society's Terms and Conditions of Sale Committee. The list goes on and on.

Wastes Little Time — Down through the years he has also been a driving force on such civic groups as the Hamilton City Board of Education, the Butler County Tuberculosis and Health Assn., the Ohio Foundation of Independent Colleges. And he was a delegate to the Republican National Convention in 1952. This list, too, goes on and on.

An average man would wonder how Mr. Rentschler could find time to do so many things, and still operate a successful business. The answer is, he gets the most out of a minute, a day, a lifetime.

He Does Relax—At the plant, he is genuinely liked and respected by employees. Like a good-natured but demanding Army top sergeant, he doesn't ask to have things done —he tells. Associates regard him as a perfectionist and a detail man.

While his co-workers know him as a man who eats, sleeps, and lives the foundry business, Mr. Rentschler's family know him as a man who can completely relax at home. He grows petunias with a passion. Every summer his expansive garden is covered with hundreds of the flowers. The passion is carried to the plant, where Hamilton Foundry can lay claim to having more petunias on its grounds than any other foundry in the U. S. It can also boast of having one of the industry's most respected presidents.



Close-up view of the three-station work fixture. Note hydraulic clamping arrangement.

3 Parts Every 36 Seconds

A large manufacturer of appliance components slashed production costs with a standard Ex-Cell-O Boring Machine. The machine rough and finish bores and counterbores the central holes in aluminum mounting flanges at the rate of *3 parts every 36 seconds!* That's 5 parts per minute!

The machine that performs this operation is the Ex-Cell-O Style 112-D, a hydraulically-operated single-end boring machine. Rugged and versatile, this machine uses one or more spindles for rotation of either the part or tools for accurate boring of a wide variety of medium and large-size parts. With the right tooling, this standard machine can handle both large and small production runs, or can be adapted to a completely automated installation!

This type of machine can make a big difference in your production figures. To find out *how much* difference get a quotation from your Ex-Cell-O representative.

Heavy lines show cuts made by tools.

Aluminum mounting flanges automatically bored on this Ex-Cell-O Boring Machine.

Full view of standard Ex-Cell-O Style 112-D Precision Boring Machine, built for extra production.

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Why Detroit Has Spring Fever

Time was when everybody waited for warm weather before buying new cars.

But disappointing spring sales indicate a new pattern in automotive buying.

■ Don't fool yourself about a big upsurge in auto buying in the next few weeks to cure all the economy's real or imagined ills. It just won't happen that way.

There's no arguing that auto buying doesn't pick up in the spring. It does. But it will have to eat through a big dealer inventory before it has any real effect on auto production. Except for a possible spurt here and there, auto production will stay level, with slight declines toward the late summer changeover period.

No Need to Panic—This isn't a scare notice. It has been established that a record auto production year every single year isn't necessary for a top rate of business. And there's a good side to the picture.

For years a stable auto production rate has been sought as a business and social necessity. Now there's evidence that one is in the making. How much of it was consciously planned is debatable. But it may be in the making.

Who Buys?—Take a look at the psychology behind auto purchases. First, there's the fellow who wants to have the first new model in the neighborhood. He was in the market last fall and his car is already months old.

Next is the buyer motivated by the warm weather. He's probably a hold-over from the days of non-improved roads. His number may be dwindling. Then there's the chap who's looking for a "deal." He will wait until late in the model season, or clean-up period.

Pattern Changes—This brings up the point of whether this spring buying surge is just whistling in the dark. Automakers still talk about it with the same zest.

Nevertheless, the spring buying surge may now be overestimated. After all, most of the 1957 models have been out since last October. Since production started a month earlier, the 1957 model production year is almost two-thirds over.

The auto market is still healthy and vigorous. But it may be time to look at it from an up-to-date viewpoint and gear your business thinking (at least that part that has automotive overtones) on a sales and production pattern of 1957, not the days when the spring thaw was the big thing.

. . . But Everybody Likes Cars

Better than TV—In spite of all the sad talk about auto sales, the automobile is still the most popular major family purchase.

A new Labor Dept. survey of six sample cities shows that more cars are purchased than any of the six major appliances. Pattern of purchases varies among cities.

Big in Texas—For example, in the small town of Anna, Ill., only 11.1 pct of families bought a car in a two-year period compared with 18.2 pct in Houston.

Taking San Francisco as a median city, 12.7 pct of families bought a car in the survey period. This compares with 9.5 pct TV set purchases; 5.1 pct washing machines; 4.4 pct refrigerators; 4.0 pct vacuum cleaners; 2.9 pct stoves; and 2.9 pct sewing machines.

The number of new cars compared with used cars also varies from city to city. In Washington, D. C., 11.2 pct of the families purchased new cars compared with 4.7 used. In Baltimore, the figures were 5.7 pct new, 4.1 pct used.

Railroads See Good Business

Business Looks Good—One of the trusted economic indicators is the rate of freight car loadings. Estimates for the second quarter point to a continued high rate of business activity.

Freight car loadings for the 32 principal commodities will be 7,789,641 in the second quarter, according to the Association of American Railroads.

Moderate Gain—This compares with predictions of 7,045,344 originally estimated for the first quarter, indicating a substantial gain in the second three-months period. Actual loadings in the second quarter of 1956 were slightly under estimates for this year. If projected loadings are fulfilled, the gain will be only 0.4 pct over the same period a year ago.

Among the commodities of interest to metalworking, decreases are expected for automobiles and trucks, agricultural implements, and ore and ore concentrates.

Increases are estimated for vehicle parts other than automotive, machinery and boilers, coal and coke, to name a few.

What the Backroom Experts Say

Detroit Rumor Mill Works Overtime

Rumors are always floating around the Motor City. This season they are thicker.

Perhaps the lull before the hoped-for spring rush makes them seem more pronounced.

Some may be valid, but it takes an expert's expert to separate fiction from truth. — By T. L. Carry.

▪ While Detroit is waiting for the warm weather buying rush to begin, the town's rumor mill is working overtime. So-called "inside information" on 1958 models, the future of tail fins, and small car production plans is to be had for the listening. And some of the information may have basis in fact.

For instance, one rumor currently making the rounds is that General Motors will not have tail fins on its 1958 models. This is pretty much accepted as a fact, even though the company has made no official announcement. Stylists are convinced that fins have seen their day.

Sculptured Steel, Maybe—At the same time, some engineers frankly question the claims for aerodynamic stability that fins are supposed to add to a car. Adoption by GM next year would appear to be more of a copying job than anything else even though sales this year indicate GM missed a bet.

The corporation is expected to go in another direction in its treatment of rear quarter panel and come up with several versions of sculptured steel. Look for the quarter panels on GM's cars next year to have areas that appear to be scooped out. Some people believe the treatment will be similar to that on the current Corvette.

Transmission Change, Perhaps—The latest rumor about Chrysler is that the corporation may put the transmission in the rear of its cars. Chrysler has been experimenting along these lines for some time. The demand for lower cars has led to an abnormal increase in the height of the drive shaft tunnel that runs the length of the floor pan. Placing the transmission in the rear would eliminate the tunnel to a great extent.

Reports are that Chrysler will leave the torque converter at the front of the car and attach the transmission to the differential at the rear axle. Such a system would not present any great weight distribution problem.

Will Mercury Add One?—There is a report that Mercury will have

Ford X-1000 Plays Up Future Style

Ford Motor Co. is giving the public a glimpse into the automotive future with the display of a scale model car, the X-1000. Designed by the company's advanced styling section, it will be shown throughout the country this spring and summer.

George W. Walker, Ford's styling director, says the model is not a dream car in the true sense, since many of its features are entirely feasible. "In fact," Mr. Walker says, "several of these features are already being considered for incorporation in our new cars."

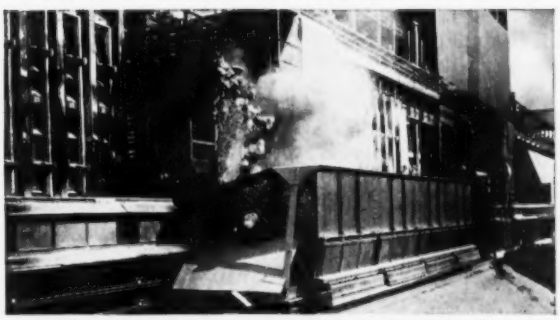
Radical But Functional — The X-1000 is influenced greatly by aeronautical design. It features a bubble type canopy, jet-pod fenders and fins that appear to float. Headlights are designed into the fender surfaces.

Many of these features, Ford says, are functional as well as artistic. The canopy, retracts to make the car a convertible which provides maximum stability.

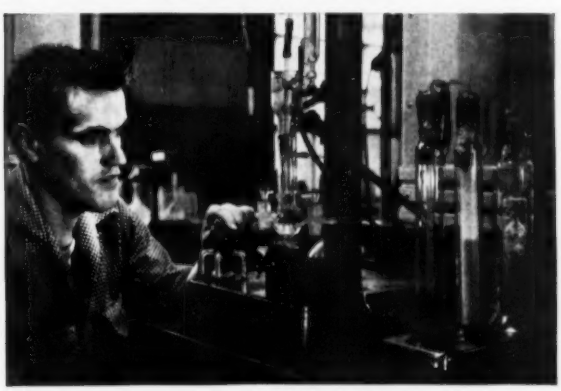
Engine Front or Rear—The car has been designed so that any of several possible new types of engines can be used either at the front or rear.

Its instrument panel is located in the center of the steering wheel. Three seats have been arranged in a triangular fashion in the passenger compartment. The driver's seat swivels for easier access to the car.

How Great Lakes Steel *blends* quality



COKE OVENS eject tons of flaming, quality controlled coke into cars for rapid delivery to quencher. Then . . .



SAMPLES ARE ANALYZED carefully to determine the amount of sulphur in the coke used in the blast furnaces.

Take five kinds of carefully selected soft coal. Blend well. Bake in a 2500° oven for 15½ hours. And if every step has been checked and double checked, the way it is at Great Lakes Steel, *presto!* You get pure, hard coke—the vital ingredient for reducing ore to high-quality pig iron.

Above, you see Great Lakes special coke recipe (cut in millionths, of course) being checked for ash impurities, a very important step in the complete analysis.

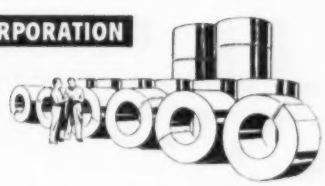
First, a sample of each kind of coal is burned to a cinder in the test furnace. Then the painstakingly mixed blend gets this dress rehearsal heat treatment, too. And this makes doubly sure that the blast furnaces produce quality iron . . . iron to make steel that meets customer specifications *to the letter!*

Quality control from raw materials to finished product—that's Great Lakes Steel! May we help you?

GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

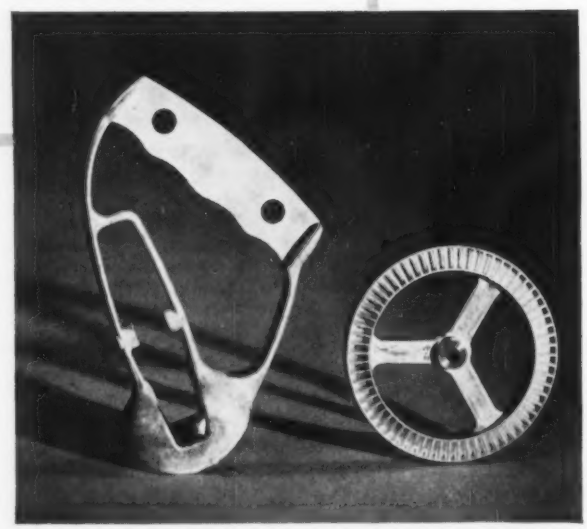


District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

There's a Good Reason why

ZINC DIE CASTINGS

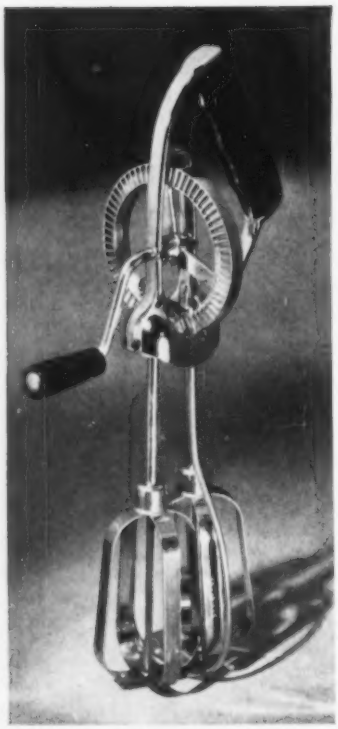
are so widely used



at

TURNER & SEYMOUR

it's



ECONOMY

Two-piece construction instead of six for the frame, gear housing, shield and drive gear on this modern egg beater is an excellent pattern for major production economy and improved design possible with ZINC DIE CASTING. Built to a toolmaker's precision, this durable and smooth-running household necessity is made by The Turner & Seymour Manufacturing Company.

LOWER PRODUCTION COST—An assembly of stampings, used for older types of beaters, require six or eight parts instead of the two ready-to-use ZINC DIE CASTINGS.

SIMPLIFIED ASSEMBLY—The gear housing and cored holes for crank, beater shafts and gears are cast in the frame. Parts fit together accurately for simple assembly without machining.

IMPROVED APPEARANCE—The flowing, modern design and smooth finish of the castings provide a perfect base for a bright chromium plating accented by black plastic handle faces.

Any die caster will show you how these money-saving and quality-improving benefits can be applied to your products.

THE NEW JERSEY ZINC COMPANY 160 Front Street, New York 38, N. Y.

The research was done and the Zamak die casting alloys were developed with

HORSE HEAD SPECIAL (99.99 + % Uniform Quality)

ZINC
FOR DIE CASTING ALLOYS

Automotive Production

WEEK ENDING	CARS	TRUCKS
April 6, 1957	132,532	24,162
March 30, 1957	130,233	22,479
April 7, 1956	133,223	24,308
March 31, 1956	125,781	24,082
TO DATE 1957	1,924,547	300,400
TO DATE 1956	1,876,158	337,976

*Estimated. Source: *Ward's Reports*

another model in its 1958 line. The new car will be one notch above the Turnpike Cruiser and has been tentatively named the Olympian.

Reason for the car is a desire on Ford's part for an even bigger saturation of the market. It is pointed out that the additional model would fill out Ford's hand in its proposed across-the-board fight with GM. The Olympian could compete with the Edsel and the Lincoln within its own company just as Oldsmobile and Buick compete with Cadillac.

Small Cars Uncertain—You can also hear reports that, although Ford might have had some plans for a small car, they have now been shelved indefinitely. Ford is still interested in the small car market, but economic factors are the biggest drawback to domestic production.

The high cost of labor makes it almost as expensive to build a small car here as it is to make a big one. However, there will be a greater intensification on importing Ford's foreign cars. Look for more emphasis to be put on the company's foreign car division in the near future, probably within the next several years.

Denials From AMC — Denying rumors that American Motors Corp. plans to ditch the Nash and Hudson cars has become a full time job for both George Romney, company president, and Louis Wolfson, biggest stockholder.

Despite the fact that major tooling for both cars has been completed, rumors persist that both will be dropped. It appears that they will continue to be circulated until the cars actually start to roll off the assembly line.

General Motors Loses Sales Ground

The auto industry's competitive pendulum is swinging in the opposite direction with quite a bit of force.

First quarter production figures are now available and they show that, although General Motors Corp. is still easily the nation's number one producer of automobiles, the company no longer enjoys the position it held last year at this time.

With the exception of Pontiac, every GM car division produced fewer cars in the January-March period than it did for the same length of time in 1956. Pontiac beat its 1956 record by 160 cars.

Gains by Chrysler—Chevrolet's production for the first 3 months this year is down 64,477; Oldsmobile produced 19,156 fewer cars; Buick's output declined 51,160 units and Cadillac's production is off 551 cars.

On the other hand, both Ford and Chrysler have been capitalizing on their increased production.

Plymouth's output for the first quarter increased 59,451 over 1956; Dodge is up 29,724; DeSoto's production rose 10,993 units; Chrysler made 7443 more cars and the company produced 8383 more Imperials than it did for the first 3 months last year.

It's the same story at Ford. Ford car production increased 66,480 units; Mercury is up by 63,848 cars; Lincoln's output increased by 198 vehicles. The only Ford division to show a decrease was the Continental. Only 278 of the prestige cars were built. This compares to 767 for the same period last year.

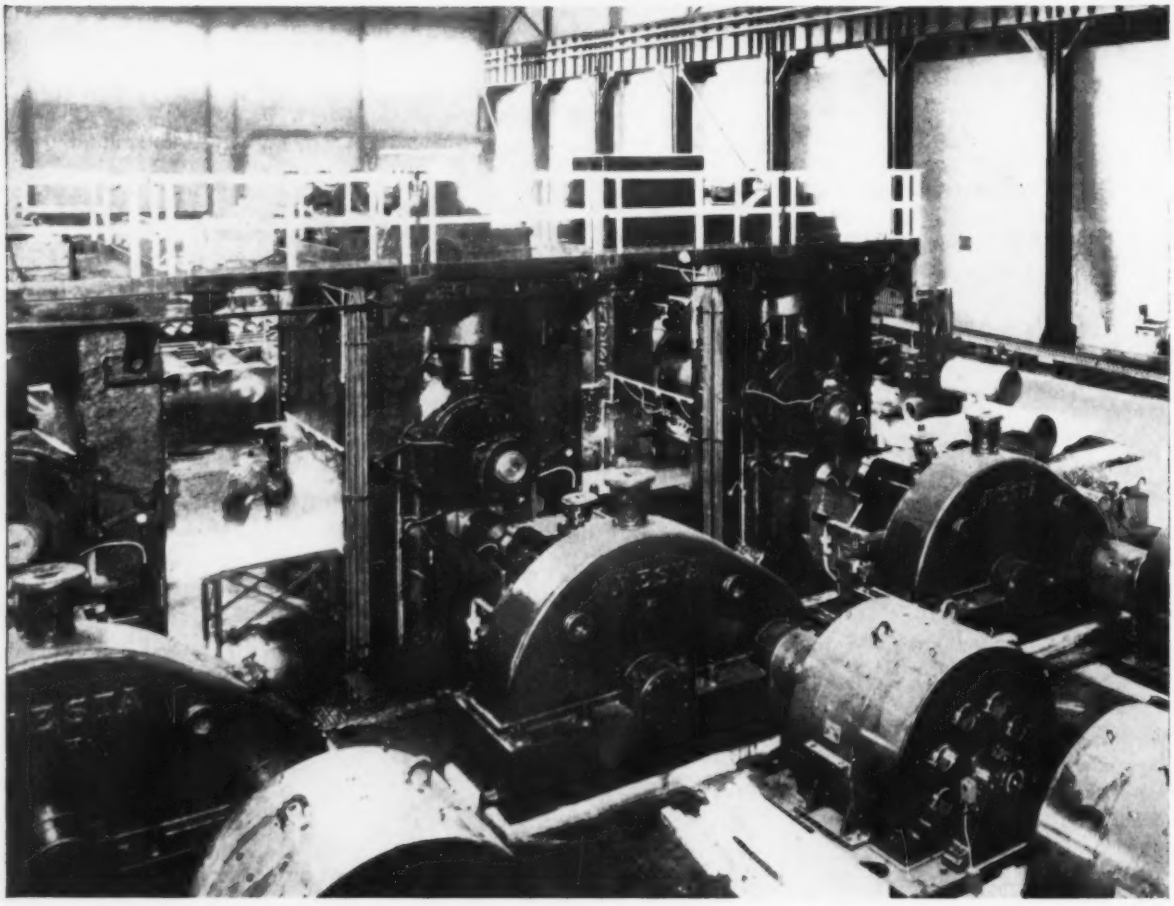
Prestige Battle — Plymouth produced 61,914 cars compared to 39,654 in March 1956. Buick made 39,958 cars last month compared to an output of 61,456 in the same month last year.

Statistically, it appears that the two cars have merely traded places. This is not entirely correct.

In addition to Plymouth, Buick is also competing with Ford's Fairlane 500 at the bottom of the line, the Chrysler in the middle and the Imperial and Lincoln at the top.

THE BULL OF THE WOODS By J. R. Williams

TH' BULL O' TH' WOODS NEVER GOES OVER A FOREMAN'S HEAD TO ONE OF TH' MEN-- TH' FOREMAN HAS TO BE THERE! SO IT'S TOUGH ON 'EM WHEN HE JUST COMES TO LOAF AN' LIVE HIS YOUNG DAYS OVER AGIN AN' WATCH THE FASCINATIN' CHIPS PEELIN' OFF A JOB!
THIS GUY'S BEEN A BOSS ONLY LONG ENOUGH TO STILL HAVE A BELLYFUL OF WATCHIN' CHIPS PEELIN' OFF AN' IS WONDERIN' IF IT WOULD LOOK BAD, THREE GUYS LAYIN' OVER A LATHE LOAFIN'!
J.R.WILLIAMS
THE ROMANCER
© 1957 by NEA Service, Inc. T.M. Reg. U.S. Pat. Off.
4-10



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against Heaviest Loads

It's the polar additives in *Texaco Meropa Lubricant* that *keep* it clinging to gear teeth and bearing surfaces even when gears are working under severe conditions of heat, pressure, or moisture.

What's more, the extreme pressure properties of *Texaco Meropa* give it a tougher, longer lasting lubricating film that effectively protects against shock or heavy steady loads. And it resists oxidation and thickening—won't foam or separate. All good reasons why gears run smoother, last longer, and maintenance costs stay low.

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FOR STEEL MILL GEAR DRIVES

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Defense Budget Is Tough to Cut

And It Would Be a Painful Operation

$40 billion defense budget has Congress concerned.

It's a heavy load on the economy of the country. But a severe cut would hit almost every business.

Government officials weigh long-range results against short-term effects.—By G. H. Baker.

▪ Every now and then, different groups of congressmen feel compelled to take a nervous, furtive look at the possible effects on the U. S. economy of a huge cut (say 50 pct) in defense spending.

The resulting guesswork is usually enough to cause even the bravest politicians to break out in a cold sweat. For there's gloomy and general agreement among all the experts that the period of transition will be rough—rough on business, on labor, and could cause the political "ins" quickly to become the political "outs."

Quite a few responsible congressment on both sides of the political aisles will tell you of their inner dismay over this year's $40 billion defense budget, but publicly they will go ahead and vote for it.

Dangerous Precedent—The off-the-record uneasiness in the Senate and House cloakrooms traces back to an awareness of history: Nations unwilling or unable to stop spending more than half their annual budgets on arms are headed for trouble.

What happens when you start to slow up a defense program that's been picking up speed over a 20-year period? William M. Martin, the chairman of the Federal Reserve Board and a forthright, honest politician, says the effect would be painful to everybody for a while. However, the "painful period" would be much shorter than most people think.

It Could Happen — Assume a theoretical cut of 50 pct in defense spending.

Mr. Martin admits such a cut—from $40 billion to $20 billion—would cause some rough jolts in both management and the labor force. But he also stoutly maintains that both management and the labor forces are tough enough and adaptable enough to spring back quickly—say, within one to two years.

Tough Medicine—But it would be worth it, Mr. Martin believes. Any nation that makes productive goods is more prosperous and its citizens are better off than a nation that specializes in the destructive goods of war.

Don't count on any such developments, this year at any rate. Plenty of congressmen believe Martin and Humphrey are right, but they fear the political consequence involved.

Ike's Disability Plan Stirs Capital

Concern Grows — Ever since President Eisenhower's heart attack, concern has been mounting over the Constitution's failure to provide for turning over the ship of state when the chief executive is too infirm to carry on.

Congress is split over how to remedy the constitutional oversight—and whether remedial action is needed at all. Here's the problem in a nutshell:

President's Proposal — President Eisenhower is proposing a constitutional amendment, stating that if a President's ability to discharge his duties is questioned, the Cabinet by a majority vote could declare him incapable and the Vice President would take over. The Vice President could initiate such action, but could not vote. Later, the President could be restored by a vote of the Cabinet.

Reaction in Congress—Congressional leaders say this would pave the way for ambitious Cabinet officers, who are not elected, to take over the government by a coup. Instead, some congressmen argue, the Vice President should be given power to take charge if a recalcitrant ailing President refused to step down. Congressional impeachment power and public opinion would prevent the elected vice president from misusing the power, supporters of this plan claim.

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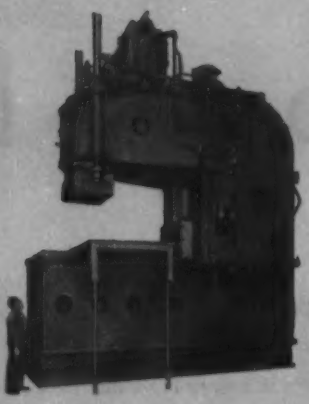
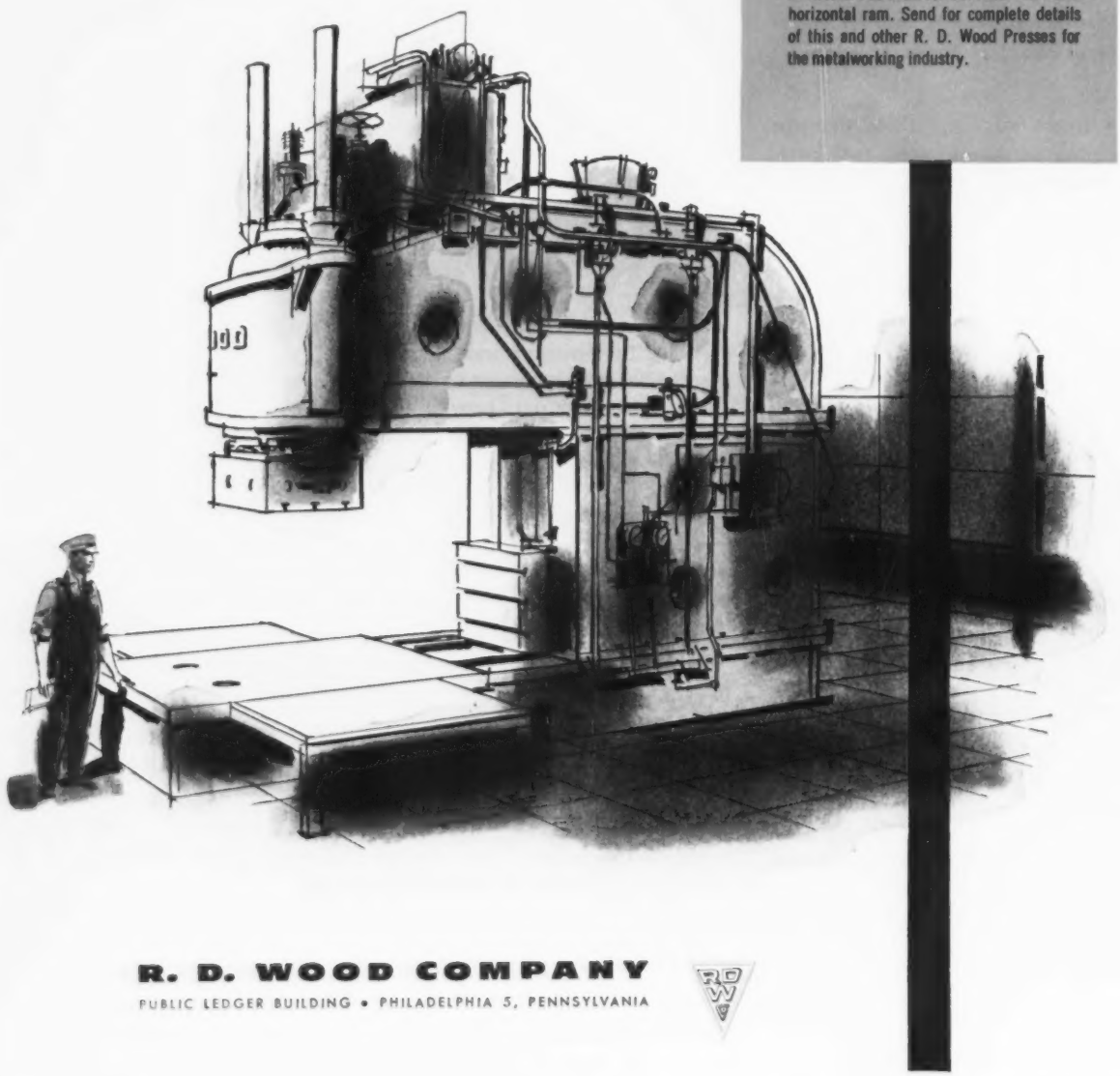
When you want a production shortcut—when downtime and costs need shrinking—there's a job for a Wood Press. And in almost every type of metalworking operation—there's a Wood Press to do the job. R. D. Wood makes standard presses for an amazing range of uses, besides designing others for special work. All have three things in common: sound design, carefully chosen materials, conscientious workmanship. *Result:* R. D. Wood Presses consistently deliver the utmost in smooth, dependable performance; fast, economical production; trouble-free operation. Write for catalog and engineering information—without obligation.



750 ton, HydroLectric open gap, self-contained press for straightening, flanging, forming, forcing and bending operations. Handles all metals. Valve system contains centralized controls for both main ram and horizontal ram. Send for complete details of this and other R. D. Wood Presses for the metalworking industry.



R. D. WOOD COMPANY

PUBLIC LEDGER BUILDING • PHILADELPHIA 5, PENNSYLVANIA

RECORD TURNOUT: Some 73,000 came to see, hear, and learn at Western Metal Congress and Exposition.

Metal Users Get Progress Report

New Methods, Machines Star at Show

Good technical information was plentiful at Western Metal Congress and Exposition.

Talks and panel discussions covered brazing, cold extrusion, new uses for titanium and molybdenum—By R. R. Kay.

▪ Make it faster, better, and cheaper. But how? The 10th Western Metal Congress and Exposition recently held in Los Angeles gave many of the answers. It was loaded with technical know-how.

Some 73,000 persons — 20,000 more than turned out for 1955's show—saw the latest in metals and machinery. The biggest metal event ever held on the Coast, it required 185,000 sq ft of floor space to take care of the 420 companies who wanted booth space.

Ordertakers Busy—The five-day show was a metalworking market place. Exhibitors reported that the number of orders placed from the floor was the biggest ever.

Western metalworking executives, engineers, and metallurgists were glad they took the time to come. They heard some of the nation's best men talk on their specialties.

Now Hear This—Here's a rundown on what those at the Congress heard:

Every day the X-ray is called on to solve more and more of industry's inspection problems.

Aircraft speeds at three times the speed of sound seem not too far off. This means we'll need structural materials to hold up at stabilized skin temperatures of about 500° F.

Management and engineers are thinking about cathodic protection as a means of cutting down corrosion's effects.

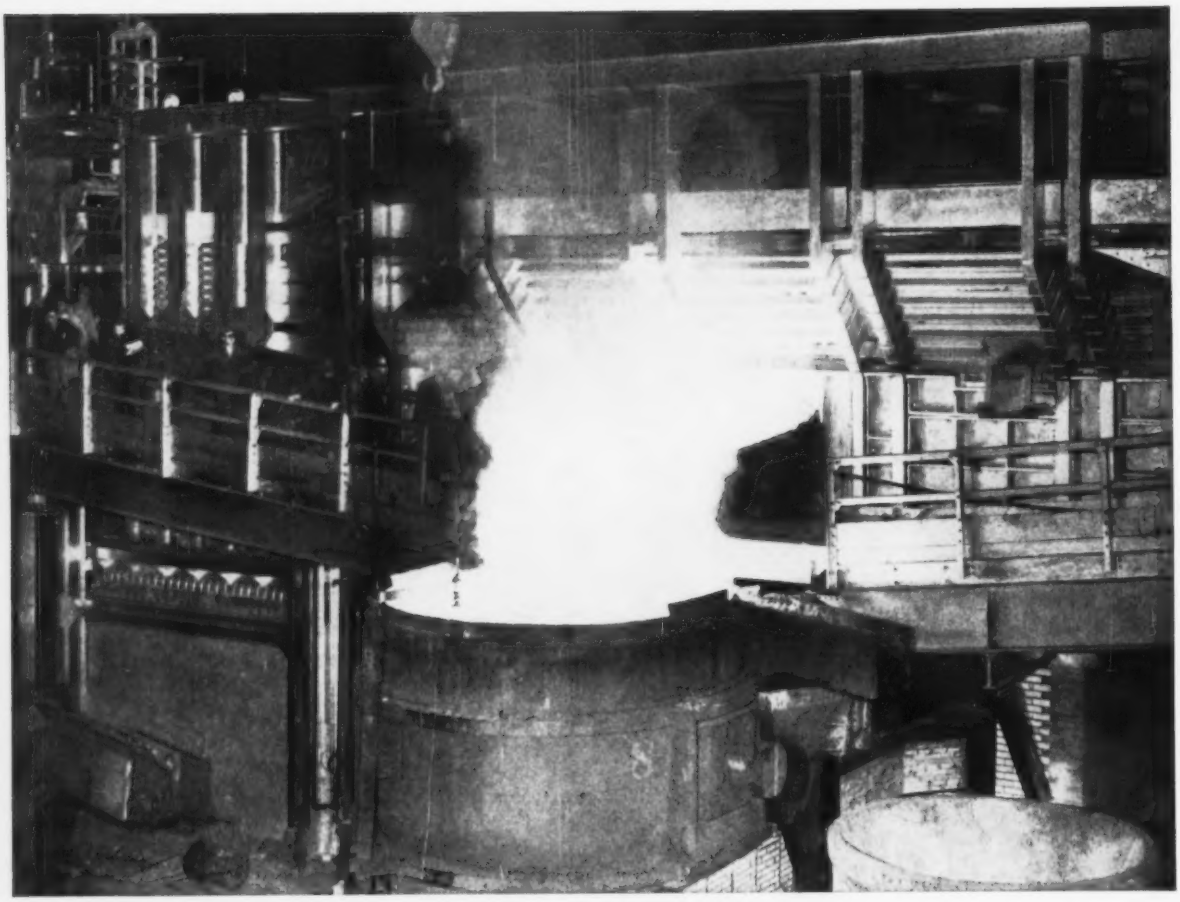
Brazing's Value—Induction brazing and soldering can help automakers cut man-hour and material costs per unit.

Furnace brazing, useful in making a variety of high quality assemblies at low cost, is finding more uses.

Cold extrusion has proved out on even the strongest aluminum alloys: 7075 and 2014. The industry is now making lengths up to 60 ft, to 8 in. diam., and in the most sophisticated shapes. Aluminum missile motor tubes for the Navy are in high quantity production.

Titanium Use Grows—Titanium is a bona fide structural material for aircraft and missiles. Demand for titanium extrusions will grow this year.

More precipitation hardening stainless steels are going into aircraft and missiles. Molybdenum has found new uses in nozzles, vanes, and other parts for missiles.



Another LOFTUS-Designed Open Hearth Furnace for Portsmouth Division, Detroit Steel Corp.

Detroit Steel Corporation recently tapped the first heat from a new 275-ton open hearth furnace at its Portsmouth, Ohio operations. This is the fifth Loftus furnace installed since 1952.

The new furnace, which is larger than the original four, is also equipped with full automatic control.

Two pass checkers have been incorporated in the design—a feature that has proved unusually successful on the other Loftus furnaces at this installation. The checker arrangement is unique in that lancing is facilitated for the full depth of the settings in both passes. This was accomplished by extending the charging floor posts to the lower pad level throughout the building, thus providing substantial access to both sides of all regenerators.

It is predicted that the performance of this new furnace will excel even the record of the original four units, which already boast one of the lowest fuel rates in the industry.

We'd like to talk to you about your requirements—without obligation. Write us today.

Designers and builders of industrial furnaces . . . **LOFTUS**

Engineering Corporation

1 Gateway Center, Pittsburgh, Pa.

140 S. Dearborn St., Chicago, Ill.

57.7.3

Cutting Tool Advice Is Needed

ASTE Meeting Raises Many Questions

Symposiums on ceramic and plastic tooling were especially popular at Texas confab.

Harold E. Collins of Hughes Tool Co. is elected ASTE president.—By E. J. Egan, Jr.

▪ Most present-day ceramic cutting tools are sintered forms of corundum, or aluminum oxide. For machining steel, the optimum speed range for these gem-hard cutting tips is between 600 and 1000 sfpm.

This information, and other up-to-date advice on ceramic tools, was eagerly sought by delegates and visitors to the recent Silver Anniversary meeting of the American Society of Tool Engineers in Houston, Tex.

The Word on Ceramics—Speakers at the popular ceramic tool symposium also said that oxide cutting tips need better means of support than is possible with present clamp-type tool holders.

Use of coolants with ceramic tools offers no particular advantage, nor is it a disadvantage, speakers said.

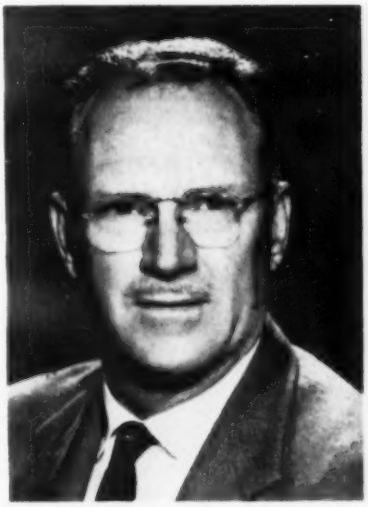
Plastics Considered — Feeds of 0.004 to 0.020 ipr, and cut depths of 0.010 to 0.375 in. seem well within the capability range of current ceramic tool compositions. Tool life is said to be improved by a negative land on the side cutting edge, 30° from the vertical of the workpiece. Width of the land should be about 80 pct of the feed rate.

Still another symposium at the ASTE meeting discussed plastic tooling.

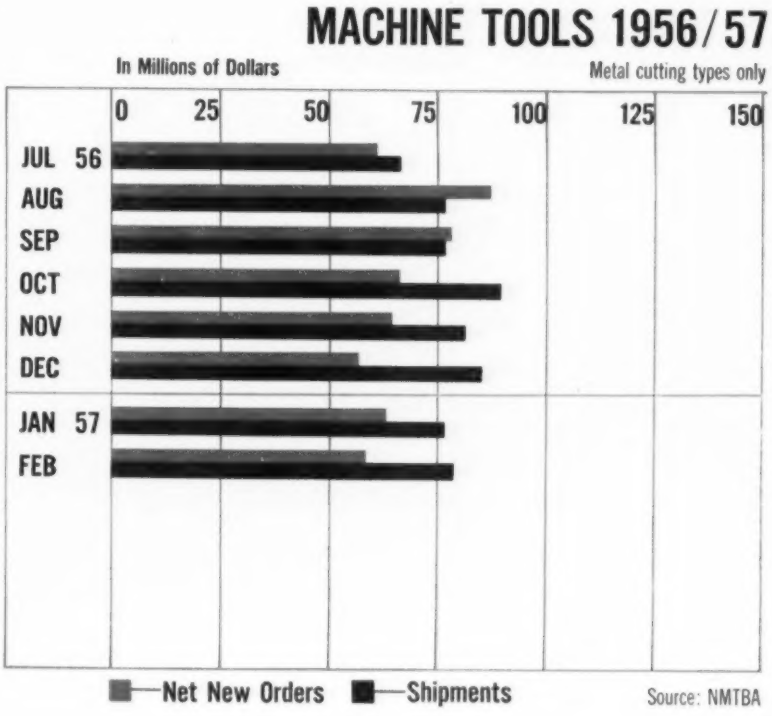
Collins Elected—Newly elected president of the ASTE is Harold E. Collins, manager of foreign operations, Hughes Tool Co., Houston.

Other newly elected officers of the Society are: First vice president, George A. Goodwin, works manager, Master Electric Co., Dayton, O.; second vice president, Wayne Ewing, president, Arrowsmith Tool & Die Co., Los Angeles.

Also: Third vice president, H. Dale Long, president, Scully-Jones & Co., Chicago; fourth vice president, William Moreland, vice president of manufacturing, F. E. Myers & Bros. Co., Ashland, O.; treasurer, John H. Ryneska, manager of purchasing, General Electric Co.'s Lynn River Works, Lynn, Mass.; secretary, David A. Schrom, plant superintendent, York Corp., York, Pa., fill out the slate.



ASTE HEAD: Harold E. Collins of Hughes Tool Co. was elected president of ASTE at Houston.



INDUSTRIAL BRIEFS

Round and Round — Proposed merger of the Whirlpool-Seeger Corp. and the Birtman Electric Co. has been approved by stockholders of both corporations. Officers and directors of Whirlpool-Seeger will continue as officers and directors of the merged corporation, which will become the Whirlpool Corp.

Hot Contract—Crucible Steel Co. of America has renewed its contract with the Air Force for development of new high-temperature steels for use in jet aircraft. The contract, renewed for one year, is under the direction of the Materials Laboratory, Wright Air Development Center.

Inventive, Incentive—A Westinghouse Electric Corp. engineer, believed to be the company's most prolific active inventor, has received a total of $18,000 from the company for patent and invention awards. Latest award for Benjamin P. Parker, advisory engineer with the switchgear division, brought $5000 for fundamental patents covering developments in grounded metal high voltage circuit breakers.

It Started Here—Saugus Ironworks, Saugus, Mass., known as birthplace of America's iron and steel industry, will open for the 1957 season on April 16. Officials expect attendence at the restoration to top last year's 22,000.

Sage Advice—Burroughs Corp. has been awarded a contract for $1,828,149 for electronic data processing and transmitting equipment for the SAGE system of continental air defense. This makes a total of more than $23 million awarded the Detroit firm for SAGE equipment in less than a year.

Extra, Extra—Aluminum Co. of America will give 225,000 readers of the Milwaukee Sentinel a free sample of Alcoa Wrap. The company will cut up 85 miles of aluminum foil into size of a newspaper page and insert a sheet in each issue of the newspaper. Facing the insertion will be a two color ad.

To Salem Towne — Yale & Towne Manufacturing Co., New York, has acquired patents, machinery, inventory and business of the Thomson Hardware Div., Standard-Thomson Corp. Yale & Towne will move the manufacturing operation of its new division from Vandalia, O., to Salem, Va., where it will become part of the Lock and Hardware Div.

Blue Notes—A series of 15 data sheets giving applications, physical information and micrographs of Carmet carbide grades is available from Allegheny Ludlum Steel Corp.'s Carmet Div. Known as Blue Data Sheets, the papers are color keyed across the bottom according to function.

Step Down—Power Transformer Dept., General Electric Corp., Pittsfield, Mass., will build a gas-filled transformer which it says will be the largest yet, for Pennsylvania Power & Light Co., Allentown, Pa. The 10,000 kw-amp unit will step down power from 62,700 volt transmission lines to 12,470 volts.

Change of Scene—The Charles A. Strelinger Co., distributor of machine tools and other industrial supplies and equipment, will move into a new "Distribution Center" on Van Dyke Avenue, Warren, Mich. The 73-year-old firm will move its inventory and office equipment from its headquarters at 149 East Larned St. Detroit. The 93,000-sq-ft facility will be open on April 15.

Blades For Guillotine—E. H. Wachs Co., Chicago, maker of a portable metal cutting saw, called the Wachs Guillotine Saw, has purchased the Power Saw Blade Div., Illinois Tool Works, Chicago. Blades produced by the Wachs acquisition will be called Guillotine Power Blades.

Dow Cabana—Purchase of 50 pct interest in Sales y Alcalis, S. A., a Mexican company, is announced by Dow Chemical Co. The company owns extensive salt mining rights in Vera Cruz. The mining site was purchased as a location for future manufacturing operations involving caustic soda and other alkali derivatives.

FOR SPECIAL SERVICE: Frank R. S. Kaplan, chairman, Copperweld Steel Co., (right) presents 25-year service pin to C. Walter Holmquist, executive vice president in charge of Copperweld's Steel Div.

NOW for heavy duty grinding . . .

you can have the fast cutting action of a softer grade with long life of a hard wheel

SIMONDS New IL BOND

Available with Red Streak Flanges — for metal to metal fit on mounting equipment — another Simonds Abrasive exclusive.

Try

SIMONDS ABRASIVE CO.

SNAGGING WHEELS with New IL BOND

It's in the wheel mix! Special chemicals and compounds added to conventional resinoid bonds provide an internal lubricant which increases the abrasive cutting action—yet retains long wheel life.

IL bond gives a distinctly different grinding action on semi-automatic and regular swing frame grinders, on floor stands and portables. IL bond in harder grade will give longer life if your present cutting rate is satisfactory, and IL bond in the same grade will increase cutting action if your present wheel life is satisfactory. Write for descriptive bulletin.

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Ohio Iron and Steel Rolls

Carbon Steel Rolls
Ohioloy Rolls
Ohioloy "K" Rolls
Flintuff Rolls
Double-Pour Rolls
Chilled Iron Rolls
Denso Iron Rolls
Nickel Grain Rolls
Special Iron Rolls
Nioloy Rolls
Forged Steel Rolls

OUR 50th YEAR
1907
1957

THE OHIO STEEL FOUNDRY CO.
LIMA, OHIO

Plants at Lima and Springfield, Ohio

OHIO

William S. Morrison, elected president, United States Steel Export Co., U. S. Steel Corp.

M. Nielsen, elected president, The Babcock & Wilcox Co.

Carleton Ellis, Jr., elected president and chief executive officer, Cavitron Equipment Corp.

Roy E. Ferree, named president, The Treesdale Laboratories, Textile Processing Co. and Pittsburgh Metals Purifying Co.

George Burnham IV, named asst. vice president, Philadelphia, U. S. Steel Corp.

William G. Whyte, named asst. vice president, Washington, U. S. Steel Corp.

Edward A. Weymouth, named manager, sales, Michigan Limestone Div., U. S. Steel Corp.

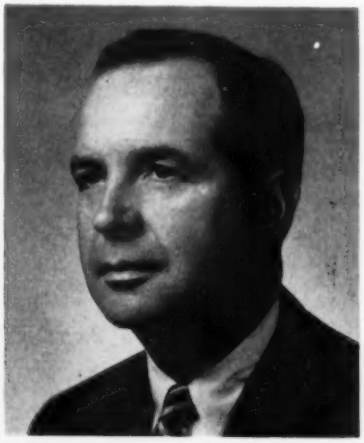
Howard J. Mullin, elected asst. vice president, sales distribution, U. S. Steel Corp.

Marcus J. Aurelius, elected asst. executive vice president, commercial, U. S. Steel Corp.

Harry J. Camillery, elected vice president, Fairview Foundry, Inc., Poughkeepsie, N. Y.

Andrew B. Pulliam, elected vice president and general manager, Marvel-Schebler Products Div., Borg-Warner Corp., Decatur, Ill.

Orval D. Berry, elected vice president, Iron Fireman Manufacturing Co., Portland, Ore.



J. M. Curto, named manager, sales, New York district sales office, U. S. Steel Corp.

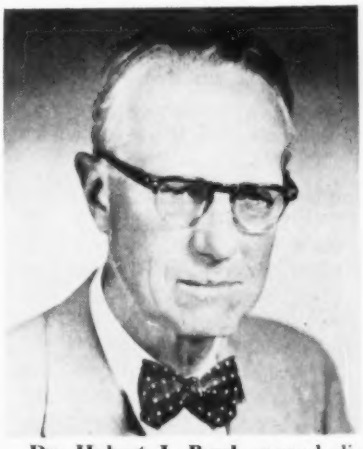
John D. Saint-Amour, elected president, Assembly Products, Inc., Chesterland, O; **Robert J. Pugsley,** elected vice president, sales manager, and director.

F. E. Stouffer, elected vice president and plant manager, Pennsylvania Transformer Div., McGraw-Edison Co., Canonsburg, Pa.

Carroll V. Roseberry, elected vice president and appointed manager, Midwestern region, Westinghouse Electric Corp., Chicago.

Robert P. Gira, elected vice president, Topp Industries, Inc., Beverly Hills, Calif.

Whitmell T. Risen, elected vice president, Replacement Div., Thompson Products, Inc., Cleveland.



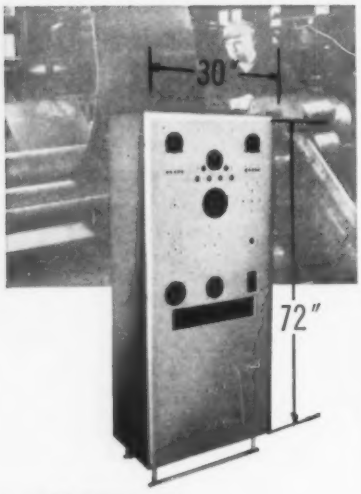
Dr. Hubert J. Pessl, named director of Research and Education, Verson Allsteel Press Co., Chicago.

John J. Fajnor, elected vice president, Brad Foote Gear Works, Inc., Chicago.

Glenn C. Lechleitner, named asst. sales manager, Clearing Machine Corp., Chicago.

Alexandar J. Yorgiadis, named product manager and chief engineer, Dynamics Products Group, Electronics and Instrumentation Div., Baldwin - Lima - Hamilton Corp., Waltham, Mass; **A. Kutsay,** named asst. chief engineer.

M. L. Bernstein, named asst. general manager, Wheeling Steel Corp., Steubenville (Ohio) Works; **L. W. Moore,** appointed asst. to



COSTLY MECHANISMS *deserve* QUALITY CABINETWORK

Any product is improved by better packaging—that's one reason why costly electrical or control mechanisms deserve cabinets, panels or boxes made to Cincinnati Ventilating's high standards of quality. We custom fabricate sheet metal to individual specifications, in any quantity. We are equipped to make almost any sheet metal part; we can stamp, shear, break, roll, weld, machine, assemble and finish all types of metal — aluminum, brass, copper, monel, stainless and all other steels. We have the facilities and the personnel to produce consistently top quality work, at competitive prices.

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general manager, utilities and development; **C. W. Drabers,** named superintendent, Openhearth Dept; **G. P. Whitaker, Jr.,** appointed asst. superintendent, Openhearth Dept.

Malcolm F. Judkins, named director, new product development, Firth Sterling Inc.; **J. Mabon Childs,** appointed product sales manager, Steel Div.; **William J. Ulm,** named asst. to vice president, sales.

R. W. Ruddle, named technical manager, Foundry Services, Inc., Columbus, O.

John L. Merrill, named manager, West Coast sales, Riverside-Alloy Metal Div., H. K. Porter Co., Inc., Los Angeles.

Malvern J. Mather, elected president, The Allen Manufacturing Co., Hartford, Conn.

Everett J. Long and **James C. Kyle,** named asst. directors, Transducer Div., Consolidated Electrodynamics Corp.

Robert F. Crawford, named specialist, pipe sales, Pittsburgh office, L. B. Foster Co.

Richard C. Cunningham, named director, sales, Eastern Stainless Steel Corp.

Harold A. Jones, appointed division accountant, Bolt and Chain Div., Republic Steel Corp.

John R. Gochnour, named manager, steel packaging sales, American Sisalkraft Corp.

Henry J. Fredericks, named Controller - Treasurer, Pratt & Whitney Co., Inc., West Hartford, Conn.

Rex D. Cross, elected vice president and general manager, Unique Balance Co., Stamford, Conn.

Fred T. Ehlert, named superintendent, Yards and Services Div., and **William E. Schultz,** named superintendent, Shipping and Warehouse Dept., Acme Steel Co., Chicago.

F. R. Light, appointed supervisor, budget section, Jones & Laughlin Steel Corp.

Louis Reiss, elected treasurer, The Motch & Merryweather Machiney Co., Cleveland.

Following appointments are within Wheeling Corrugating Co.'s Building Materials Sales Div.: **E. J. McCormick,** appointed sales manager, expanded metal section; **R. E.**

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Improve hardenability and hot-working characteristics in steels—at pint-sized cost!

No major changes in steelmaking techniques need be made to reap the benefits from economical, efficient Grainal Alloys. What's more, millions of tons of steels produced with Grainal have been the proving ground for these reliable alloys that give such remarkably consistent hardenability results.

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Get more facts about either Grainal No. 79 or Vanadium Grainal No. 1 from your nearest Vanadium District Office — and write today for your FREE copy of "Grainal and its Uses."

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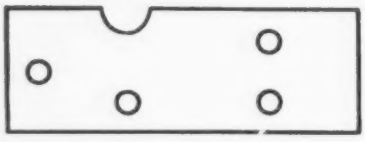
How to SAVE on STAMPINGS

If you buy stampings, it will pay you to read these important suggestions. They will help *us* to help *you*... (1) with faster deliveries... (2) with lower prices.

Your blueprint and the data on it are our bible! We must assume that all tolerances and limitations shown are strictly essential to the functioning of the finished part.

We want to—and we will—give you *exactly* what you require. But if there are unnecessary restrictions or requirements you'll be paying more than you need to. You don't like that. We don't either.

FOR EXAMPLE:



Here's a simple, hypothetical stamping. Tolerances for all the holes and the slot are specified "plus or minus .001"—so we assume such close tolerances are essential to the proper functioning of the piece.

In the light of these close tolerances, your part would cost you $X per M. In effect *you* set the price. We don't. But your parts, when you get them from *this* shop, will meet every one of those specs.

Now, from long experience, we know that in many cases like this some of the requirements *could* be relaxed.

Let's say, for example, that plus or minus .003 is actually adequate for 3 of the 4 holes and the slot. It's comparatively easy to hold to .001 on *one* hole if there's a latitude of plus or minus .003 on the other holes and the slot.

How would these modifications affect what you pay? Your cost would be a *fraction* of $X per M, probably a *small* fraction. That would make *you* happy, *and* us too.

OTHER WORTHWHILE POINTS:

Quantities. Order maximum. Higher quantities mean lower unit cost. Three runs of 2,000 can't cost the same as one run of 6,000.

Short Runs. If you want *short run* stampings, try to set your tolerances accordingly. It isn't practical to hold the same tolerances in Short Runs as in Production Runs.

De-burring. If you must have *all* burrs removed that's readily done. But if *smooth pieces* will do, don't specify "Remove all burrs." You'll save money.

Punched Holes. When specifying hole size try to specify a standard punch size. Saves you the cost of a custom made punch.

A WORD TO THE PURCHASING AGENT:

When requirements or specs appear more stringent than necessary, we question them with the customer. But this takes time. **Therefore—to help save time and money—we suggest you do not include any specification, tolerance or limitation for which you are not willing to pay.**

For more complete information, send for our free 12-page booklet, "Service in Stampings"

—STAMPINGS DIVISION—

"One Piece or a Million"

3204 Union Street, Glenbrook, Conn.

LAMINATED SHIM COMPANY, INC.

Pierce, named sales manager, metal lath section; **N. P. Travers,** appointed sales manager, steel roof deck section.

Marcus M. Chapman, elected vice president, Sales Div., U. S. Steel Corp.

Gordon S. Graham, named Toledo district sales manager, Aluminum Co. of America.

William V. Crowley, named sales manager, Western Div., ALWAC Corp., Hawthorne, Calif.

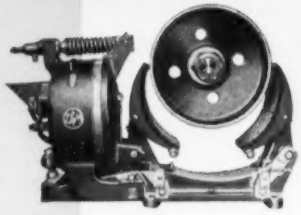
Lewis J. Patterson, named manager, Northern district, Michigan Limestone Div., U. S. Steel Corp.

George C. Jennings, appointed New York district sales manager, Wickwire Spencer Steel Div., The Colorado Fuel and Iron Corp.

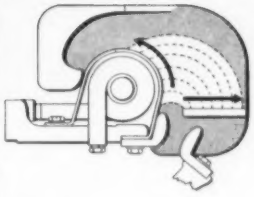
Following promotions are within the Rochester Products Div. of General Motors. **Robert W. Decker** named division works manager, and

It's EC&M for a Complete Line of ELECTRIC CRANE CONTROL

BRAKES · DISCONNECT SWITCHES · CONTROLLERS · LIMIT STOPS

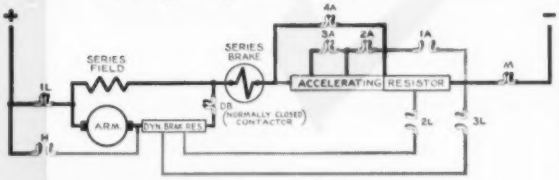


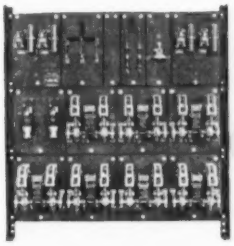
LONG-LIFE BRAKES for cranes operated by A.C. or D.C. power. High speed performance. Low upkeep.



CONTACTORS operate on the LINE-ARC principle. No destructive burning of arc shields. Cool contacts and reduced maintenance.

DYNAMIC LOWERING CIRCUITS for hoist motions. Respond quickly. Permit accurate inching for spotting loads.

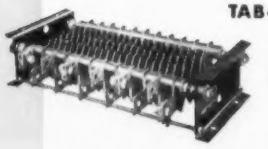




REVERSING-PLUGGING CONTROL for bridge and trolley motions. Automatically controlled acceleration. Only one simple relay for plugging.

YOUNGSTOWN SAFETY LIMIT STOPS protect against overhoisting accidents. Positive check against human errors.

CAM-TYPE MASTER SWITCHES have narrow width and short throw. Less operator fatigue



TAB-WELD PLATE RESISTORS —spot-welding provides a continuous path, and keeps resistance value constant.

MANUAL-MAGNETIC DISCONNECT SWITCHES are very easy to operate. They are arranged to control crane lights, too.

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A DIVISION OF THE SQUARE D COMPANY

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Paul H. Krueger, appointed manager, manufacturing, The Hays Corp., Michigan City, Ind.

Ralph B. Austrian, named sales manager, Ling Electronics, Inc.

Charles F. Menzer, named works manager, Alloy Steel Casting Co., Southampton, Pa.

Gerhard Reyerse, named Cincinnati district sales manager, The Patterson Foundry and Machine Co., East Liverpool, O.

Wesley Timmcke, named manager, engineering, Industrial Div., Warner Electric Brake & Clutch Co., Beloit, Wis.

Themis C. Pailas, appointed regional sales manager, Cleveland district office, Heli-Coil Corp., Danbury, Conn.

Gordon N. Dow, appointed general sales manager, Leschen Wire Rope Div., H. K. Porter Co., Inc., St. Louis, Mo.

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ERIE Bolts • Studs • Cap Screws • Nuts

In Alloys • Stainless • Carbon • Bronze

Your most exacting specifications take precision form in the hands of our expert craftsmen. Bolts—Studs—Cap Screws—Nuts as specified to resist corrosion, extreme temperatures and tensile stresses are the product of more than 40 years continuous production of highest quality fasteners for a wide diversity of industries.
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ERIE BOLT & NUT CO.
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Representatives In Principal Cities

Charles C. Brandon, appointed director, production and material control and purchasing.

Hardie W. Beck, named sales manager, Pittsburgh steel service plant, Joseph T. Ryerson & Son, Inc.

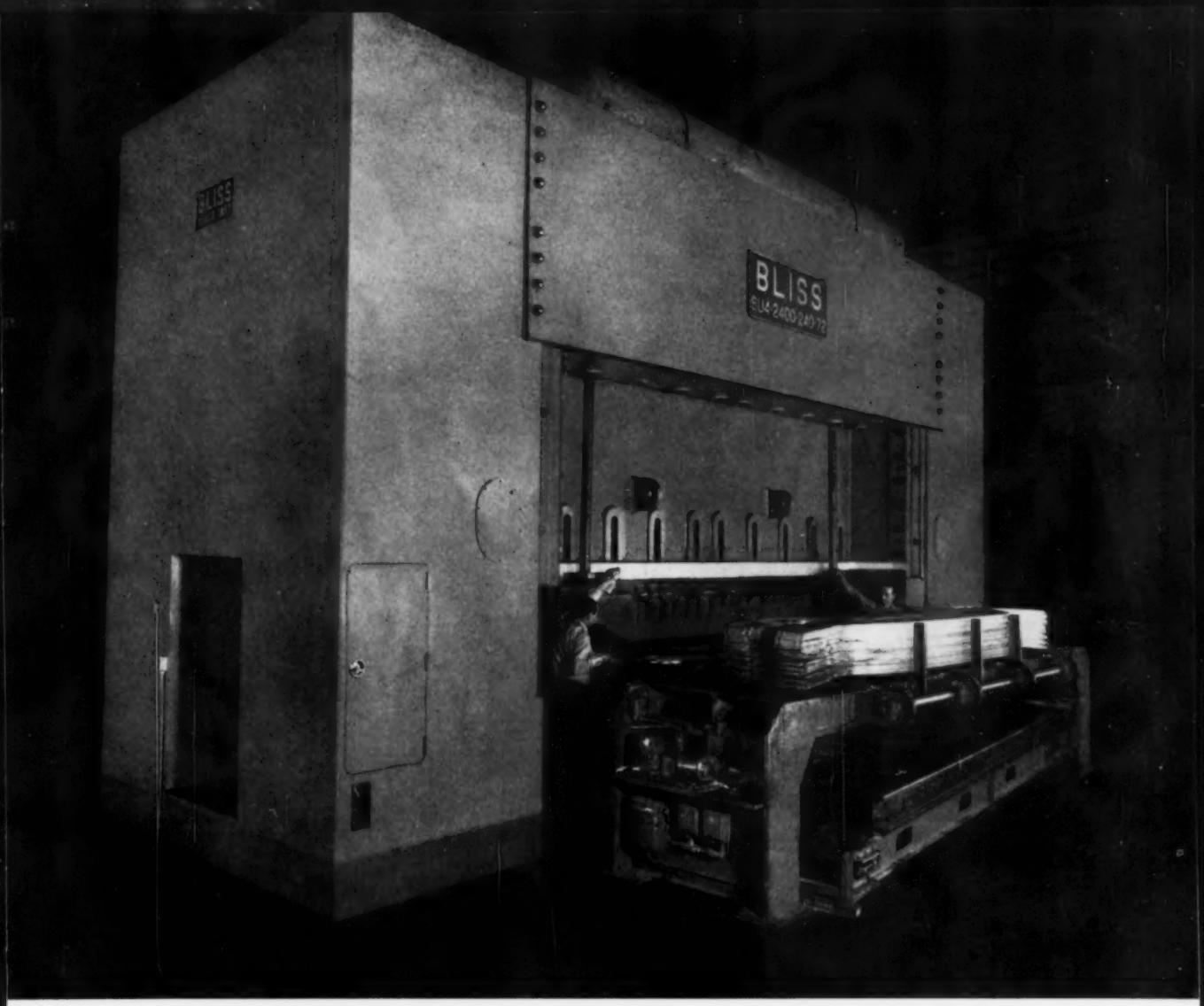
William O'Dell, named district manager, operations, Southwestern section of the U. S., The H. M. Harper Co., Morton Grove, Ill.

Raymond Boyd, Jr., named manager, industrial divisions and foreign operations, The U. S. Hoffman Machinery Corp.

A. S. Ault, named general manager, Chicago Vitreous Corp., Cicero, Ill.

George T. Fraser, named Western regional sales manager, Crucible Steel Co. of America, Los Angeles.

Henry A. Sturm, Jr., named New England regional sales manager, Crucible Steel Co. of America,



LOW, WIDE and HANDSOME

. . . it's the largest of its kind in the world

This is the largest mechanical underdrive press in the world. It is 40 feet long, 20 feet above floor level, 22 feet below, and has a capacity of 2400 tons.

And what a job it does! At the Reading, Pa., plant of Parish Pressed Steel Company, it stamps out 20-foot-long auto chassis side rails from thick hot-rolled steel blanks... two per stroke, sixteen per minute. Or, by using the cushion between the openings in the uprights, it produces 30-foot-long truck chassis rails.

Like Parish, many a firm is shifting to underdrives wherever it can. Their low silhouette fits into one-story plants. And with the entire drive "down under"—below the working floor — maintenance becomes simpler and faster. It's the modern press for the modern plant. In other words, it's Bliss.

BLISS
SINCE 1857

100 years of making metal work for mankind

E. W. BLISS, COMPANY, Executive Offices, Canton, Ohio

Presses • Rolling Mills • Mill Rolls • Can Machinery • Die Sets • Ordnance

Boston; **Kenneth C. Kelly,** named Southern regional sales manager, St. Louis, Mo., headquarters; **Edward K. Streeter,** named Mid-Western regional sales manager, Chicago headquarters; **William E. Pennington,** named Eastern regional sales manager, New York headquarters.

A. J. Zauher, named chief product engineer, U. S. Steel Homes Div., U. S. Steel Corp.

Robert L. Rudolph, named chief chemist, Quality Control Dept., Rem-Cru Titanium, Inc., Midland, Pa.

N. L. Mahla, named Cleveland district sales manager, Clearing Machine Corp.

J. W. Stack, named director, sales and contracts, Milwaukee plants, AC Spark Plug Div. of General Motors.

Martin C. Falk, appointed chief engineer, Steel Equipment Co.

Robert C. Kuhn, named East Central regional sales manager, Crucible Steel Co. of America, Cleveland.

Bernard J. Alperin, named development engineer, Applied Research and Development Laboratory, Foundry Dept., General Electric Co., Schenectady, N. Y.

Harland L. Printz, appointed superintendent, tooling, Aviation Gas Turbine Div., Westinghouse Electric Corp., Kansas City, Mo.

OBITUARIES

Ernest Mortensen, retired president and general manager, Wesson Tool Co., Ferndale, Mich.

Carl D. Salisbury, 75, retired chief engineer, Cleveland Diesel Engine Div. of General Motors Corp.

Arthur J. Wieland, 61, vice president, Ford Motor Co. and General manager, Ford's International Div.

Garnett M. Harris, 61, retired general superintendent, Ensley Steel Works, Tennessee Coal & Iron Div., U. S. Steel Corp.

J. Harrison Sylvester, 43, plant superintendent, O. Hommel Co., Carnegie, Pa.

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FABRICATING
IngAclad
STAINLESS-CLAD STEEL
With its standard cladding of 20% solid stainless inseparably bonded to an 80% backing of carbon steel, IngAclad costs substantially less than solid stainless.
Easier to fabricate, too. Can be bent, twisted, punched, formed, drawn—yet requires no special equipment.
Plus—all the corrosion resistance and protective properties of solid stainless on the clad side.
See how IngAclad may be the answer to your stainless cost problems. Write, wire or phone for details.
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Ingersoll STEEL DIVISION BORG-WARNER CORPORATION
310 S. Michigan Avenue • Chicago 4, Illinois • Plant: New Castle, Indiana

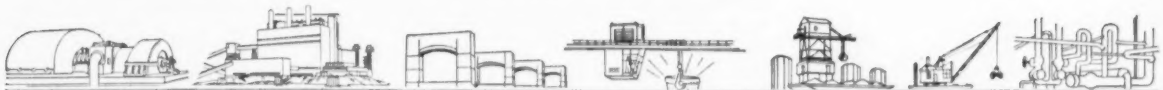
Unique "PUSH-PULL" boat hauls twice as much oil . . . FASTER

East coast barge transportation presents unusual problems. Routes traverse both open and sheltered sections of the intracoastal waterways. Steuart Petroleum, an oil products marketing company operating in this area, needed to reduce round-trip time and increase the amount of tonnage hauled.

Dravo engineers provided the answer with two integrated tank barges and an unusual combination harbor tug and river towboat, the "Papa Guy." This versatile boat is equipped to pull the specially designed barges on a hawser or push them. Because "push towing" is more efficient, hawser towing is used only during heavy weather in exposed waters. Results? On normal runs, round-trip time has been cut 25% and tonnage per trip doubled.

Dravo shipyards have launched more than 3,700 hulls, providing a solid background for solving marine equipment problems. For information on barges, towboats, or any of the products and services listed below, write DRAVO CORPORATION, PITTSBURGH 25, PA.

DRAVO
CORPORATION



Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping

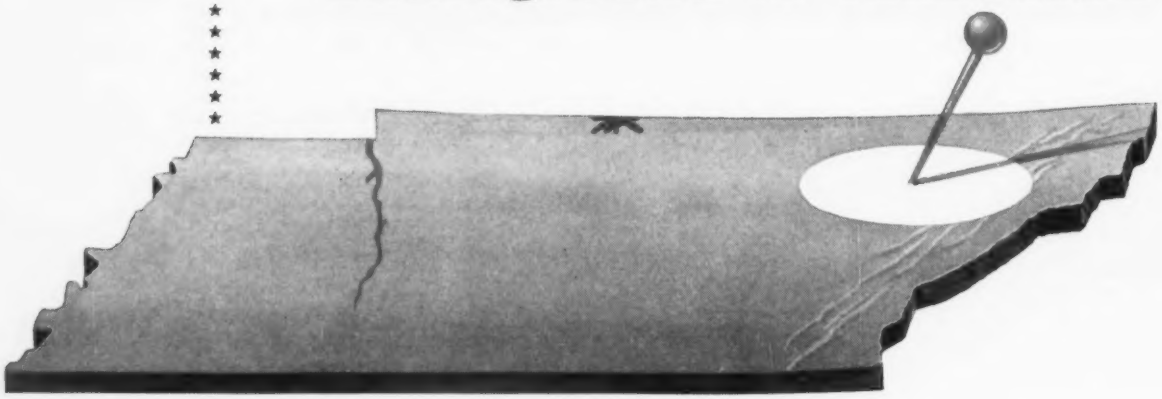
foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes

river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

We've discovered

PART OF AMERICA'S FUTURE

underground in Tennessee



As the American economy has expanded, the use of zinc by industry has greatly accelerated, until today's per capita consumption of zinc shows a giant 24% increase over the per capita consumption only seven years ago.

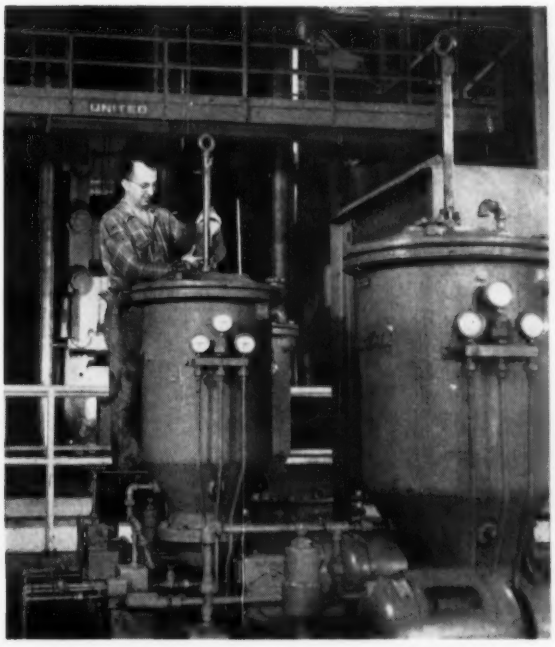
But what about the future? With zinc's importance to Industry's ever-increasing demands, what about the supply?

In recent months, American Zinc has discovered a part of America's industrial future... underground in Tennessee. In the East Tennessee area, mining properties which adjoin American Zinc's long-established Mascot, Tenn., mining operations, exploration and development have confirmed zinc ore reserves underground which are equivalent to *more than 75 years' production at the current rate* of mines now operating in this area.

Tomorrow's zinc for automobile grills and trim... the galvanized coatings for steel... zinc for die-castings and brass... zinc pigments for paints and rubber... now lies underground in American Zinc's Tennessee development.

American Zinc, lead & smelting company

Columbus, Ohio · Chicago · St. Louis · New York · Detroit · Pittsburgh



GETTING A DRINK: Replenishing the lubricating oil reservoir is all the manual effort needed to lubricate critical parts of a 35,000-ton press at Alcoa's Cleveland works. (Farval Corp. photo)

Force High Overhead Costs Down With Centralized Lubrication

By E. J. Egan, Jr., Machinery Editor

Centralized lubrication systems hit plant-operating costs like a chain reaction.

They cut down on lubricant consumption, machinery repairs, power bills and accidents.

Literally, each saving leads to another. Want proof? Here's an easy way to check the potential benefits in your own plant.

■ It's a safe bet that if you aren't already using centralized lubrication on your plant equipment, someone is trying to sell you on the idea. It won't hurt to listen. The right setup could be one of the best investments you'll ever make.

Don't let yourself get confused by a lot of technical details concerning the various systems. And don't be too anxious to talk price. You might be scared off—all too soon and without good reason. Just keep an open mind and concentrate on the fundamentals.

The inescapable fundamental fact is that all machinery requires lubrication. But that doesn't mean you drench it with oil or smear it with grease. To minimize the effects of rolling and sliding friction you apply these materials only at specific bearing points. As often as not these bearings are difficult—even dangerous—to reach by hand.

The Old Way—It's true enough that for many years hand lubrication was the only way to do the job. The long-spout oil can and the flexible-nozzle grease gun helped considerably. But you can't get away from it; hand lubrication was and is a slow process.

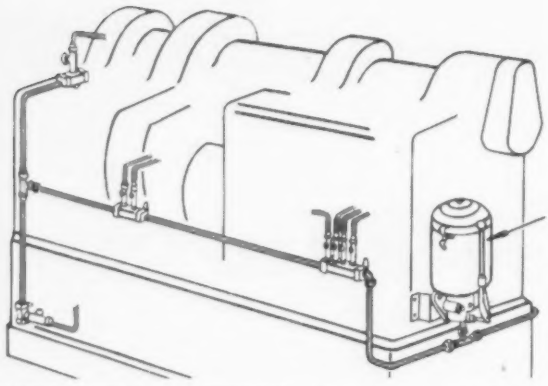
For a long time this didn't matter much. Bearings weren't always the jewel-like assemblies they are today. Machinery didn't move very fast, either. So casual, even careless lubrication was often good enough.

But failure to give modern, high-speed bearings and machines their exact lubrication nourishment is tantamount to committing sabotage. Too little, too much or the wrong kind of oil or grease leads to burnt-out bearings and other troubles. You don't produce anything with a shut-down machine except headaches—expensive ones.

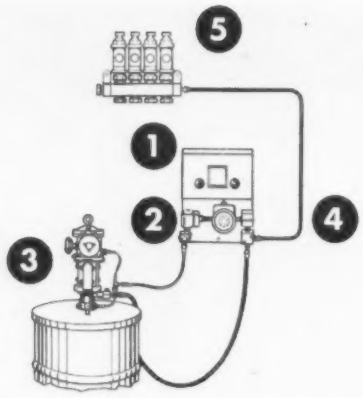
And So—That's why centralized, controlled lubrication came into the picture. It has but one purpose: to deliver the **right amount** of the **right lubricant** to the **right bearing** at the **right time** — and to do it automatically.

You can install centralized lubrication on one machine, or branch it out to cover a bank of 100. Just keep the oil or grease reservoir filled and you can transfer your hand oilers to other jobs. Chances are they'll make more money for themselves, and for you, too. A centralized system watches itself. If it can't feed any one bearing properly, that particular machine will shut down, not break down.

Look at centralized lubrication this way. You pay plenty for fast, precision machines to give you one thing — maximum production. To keep them running at top speed, mere preventive maintenance might be too lackadaisical a concept. So gear your thinking up a notch.



FOR SINGLE MACHINES: Manually-operated system needs only a few strokes of the pump handle to build up required pressure. Injector valves are usually manifolded, are also adjustable so that the correct amount of lubricant goes to all bearings through short feeder lines. Indicator at pump and one at each valve shows when cycle is complete. Valves recharge automatically when pump is released. Pump may also be actuated electrically, mechanically, hydraulically or pneumatically. (Drawings shown here are from Lincoln Engineering Co.)



BUILT-IN MEMORY: Schematic of a centralized system that cycles automatically, according to whatever intervals are set on the time clock (1). Clock energizes the solenoid air valve (2) permitting air supply to pass to the air motor of the pump (3). Lubricant, under pressure, is dispensed through the supply line (4) discharging injectors (5) at line pressure. Injectors automatically recharge when pressure is relieved in supply lines, completing the lubrication cycle. Such systems usually have an alarm to signal a low-lubricant level or a line rupture.

Groove it in terms of "productive" maintenance.

Choice is Clear — By now you should have the overall picture, in theory, at least. It gives you a choice between two techniques. One makes use of lubrication controlled every way you can think of. The other involves the gamble of doing the job by hand.

The decision is a big one. Naturally you want proof of the advantages claimed for centralized lubrication. You want facts, figures, and possibly a sidelong glance at what your competition is doing about this thing.

The leading producers of these systems are quick to accept this challenge. Among this group are such well known firms as Alemite Div., Stewart-Warner Corp., Chicago; Bijur Lubricating Corp., Rochelle Park, N. J.; The Farval Corp., Cleveland; Lincoln Engineering Co., St. Louis; and Trabon Engineering Corp., Solon, Ohio.

Affects Many Costs—All of these firms have plenty of outstanding case histories with which to hammer away at your doubts. The idea is to prove that centralized lubrication is a key factor in virtually every one of your operating-cost areas.

In fact, Lincoln Engineering Co. makes this provocative statement its basic theme: "No other single operating investment affects so many overhead charges."

It isn't too hard to check your own firm out on some of these operating-cost areas. You don't have to get involved in a lot of technicalities, either. Remember, you're just trying to decide whether the **idea** of centralized lubrication is good for your business.

Start With Usage—A good place to start is with the claim that centralized lubrication will reduce your consumption of oil and grease. Well, if you're lubricating by hand, how many types do you buy, at what cost per drum? How much do you use per week, month or year?

A centralized system can most likely save you money here. For example, here's how much Alemite's Oil-Mist system has cut lubricant usage on some typical equipment items: (1) on a 110-ton Minster press, up to 90 pct; (2) on an 80-in. Mesta continuous rolling mill, from $7.00 to $2.90 worth per 8-hr shift; (3) on a 60-ton Niagara OBI press, from 32 oz to 2 oz every 16 hr.

Then there's a Trabon system in a Chicago can-making plant that cut the anual grease bill by 86 pct. And a 62-point Farval system on a pipe-bending roll machine that saved over 15,000 lb of grease per year. And a Lincoln installation for Hanna Coal Co. that chopped the number of lubricants needed from 27 to 9. The list could go on and on.

Avoid Too Much—The moral is simple. Under-lubrication is bad enough. But so is over-lubrication. Not just because it wastes grease and oil, or because the excess usually drips in all the wrong places. Worse yet, it can ruin expensive bearings.

Here's another cost-area checkpoint. How many man-hours and wage dollars does it take to hand lubricate your equipment each day, week, month? Also, what do you spend for oil cans and grease guns?

If you're surprised that hand lubrication takes a lot of time and money, go out in the plant and look at the reasons why. Count the lubrication points these men have to service. See for yourself what an awkward job it is; dangerous, too, if a man has to use a ladder, or work while the equipment is running.

Metered Delivery — Centralized systems eliminate the effort, time and cost of doing the job by hand. A pump and a network of tubing and valves do all the work. Grease or oil, as the case may be, is metered out to every bearing in exactly the prescribed manner.

If you insist on having an oiler, give him a system with a hand-operated pump. A few yanks on the handle and he's through for the day. Or maybe he'd rather push a button to operate the pump. It can be arranged. Actually, many modern systems use automatic timers to trip the pump-actuating device.

The significant thing is that the automatic, controlled system does the whole lubricating job in seconds; say 30 seconds for a punch press while it's operating at full speed. It takes the average hand oiler 18 minutes to do the job, and with the press shut down for safety's sake.

It's easy to see that where there are many machines or bearings to be lubricated, it's no trick at all for centralized systems to save thousands of dollars per year in labor costs alone.

Save Idle Time—And that leads directly to the next point. Excluding downtime for repairs, how many hours per week or year do your machines stand idle while they're hand lubricated? In most cases, centralized systems simply eliminate this loss of time. They work while the equipment is running, which is better for the bearings, actually.

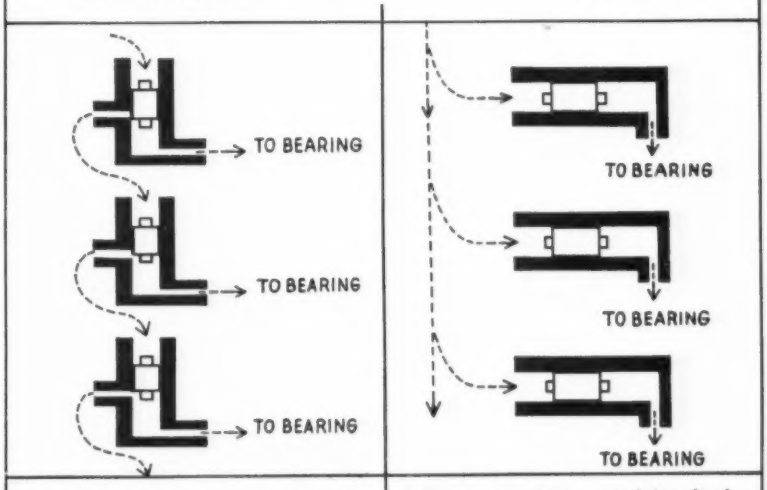
Is it worthwhile to save this shutdown time? The Dana Corp. thinks so. Putting Lincoln equipment on a group of 60 special machine tools in one of its plants yielded a 20 pct increase in production. This was equivalent to buying 12 more machines at a capital outlay of about $816,000, plus tooling cost.

Another operating cost to think about is downtime for repairs. Estimate your yearly downtime at present just to replace bearings or other parts worn out because of faulty lubrication. Also, how much do these replacement parts cost, and what do you pay the men who install them?

Now convert this lost time and money into lost units of production. And remember that when a key machine is out of business, others may be forced to quit, too.

Customer Insurance — It's to be hoped that such breakdowns have never cost you a contract cancellation or the goodwill of some valued

Two Basic Forms of Piston-Type Metering Valve Systems



Pump develops necessary pressure to overcome line and bearing resistance. Lubricant flow operates valves "IN" main line. Excessive pressure at pump indicates failure of valve to operate.

Pump develops predetermined pressure. Valves operate "OFF" main line. Individual tell-tales at each valve indicate failure of valve to operate.

Advantages of Centralized Lubrication Systems

(Tabulation of replies to an Iron Age survey from 683 metalworking plants.)

Advantages	Total No. of Mentions	Mentions for Biggest Single Advantage
Savings in repair costs (labor & materials)	578	275
Reduced downtime	534	162
Convenience & working conditions	413	55
Safety (elimination of hazards to workers)	358	57
Savings in lubricants	314	29
Savings in power consumption	136	3
Faster machine operation	133	6

Applications for Centralized Lubrication Systems

Machine Tools and Other Metalworking Machinery

Lathes	Press brakes
Grinders	Shears
Milling machines	Forging hammers
Boring machines	Planers
Drilling machines	Shapers
Thread rollers	Welding equipment
Saws	Plating machines
Stamping Presses	Die casting machines

Steel Mill and Wire Mill Machinery

Rolling mills	Coilers
Pipe and tube mills	Wire drawing machines
Roll levelers	Wire coating machines
Roll tables	Stranding machines

Furnace and Heating Equipment

Roller hearth furnaces	Electric melting furnaces
Annealing furnaces	Induction heating equipment
Blast furnaces	Drying Ovens

Foundry Equipment

Shakeout machines	Charging machines
Sand mixers, slingers	Casting machines
Vibrating screens	Blast cleaning machines

Materials Handling Equipment

Overhead cranes	Industrial trucks
Conveyors	Revolving cranes

Miscellaneous

Compressors	Sintering machines
Pumps	Packaging machines
Eyeletting machines	Speed reducers

Look at your average monthly power bill. Proper lubrication can often cut it by eliminating excessive machine friction.

customer. But if they ever have, the man who sells centralized lubrication has an "insurance" policy he wants to show you.

It might pay for its premiums many times over. As in the case of Whiteway Stamping Co., Euclid, Ohio. The firm has long had Farval systems on its stamping presses and in 26 years claims it has never lost a bearing because of improper lubrication.

Whiteway's estimated saving in oiling labor over this period is $66,000, to say nothing of thousands of hours of production time gained. Yet the average cost of equipping each press with a complete system was only $1087.

There's More — Other users of centralized lubrication systems report equally impressive savings in the area of downtime costs. For example, here are some random replies to an IRON AGE survey: "Reduced spindle bearing failure on an automatic to zero" . . . "Downtime cut at least 75 pct after installing system on Wheelabrator lines" . . . "Tripled operating time between overhauls to rebush turnable parts" . . . "Flywheel bearing on a 300-ton press brake has only been replaced once in past five years—formerly took 16 hours of downtime every 6 months."

The fact that controlled lubrication staves off these major repairs might also be important to you in still another cost area: the amount of money you keep tied up in stocks of replacement parts.

Then, too, it's not unusual for centralized systems to get the credit when machines produce fewer rejects, or when the overall quality of production improves. Take the case of a well known automobile manufacturer who put a time-clock controlled system on a battery of 18 cam-milling machines. The result: rejects cut by 80 pct.

Your Move — It shouldn't take you long to figure out what even a far less spectacular reduction in your own reject rate would mean; or what better-quality products can do to insure repeat orders from customers. But such benefits can hardly accrue when equipment mechanisms get out of alignment or function erratically because of improper lubrication.

One more cost item to look into is your average monthly power bill. Here's where excessive friction in your machines can cost you plenty. On the other hand, proper lubrication can often cut power bills appreciably.

That's what happened when The Miller Co., Meriden, Conn., installed a Lincoln Engineering Co. centralized system on its brass rolling mills. Power consumption dropped 30 pct, and bearing life shot up 1500 pct.

If your checkup on all of these operating-cost areas shows that some form of centralized lubrication might be what you need, the next step is clear. It's time for your plant engineers to look at the technical and cost details of the various systems. Don't be surprised if they have their recommendations all ready. That's their job.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

Keep Corrosion At Bay With Chromates

Preventing corrosion (or at least, retarding it) is desirable on most products. On some, it's an absolute essential.

Underwater aluminum parts in reactor installations are in this must group. Corrosion can mean radioactive contamination.

Chromate conversion coatings help lick the problem.

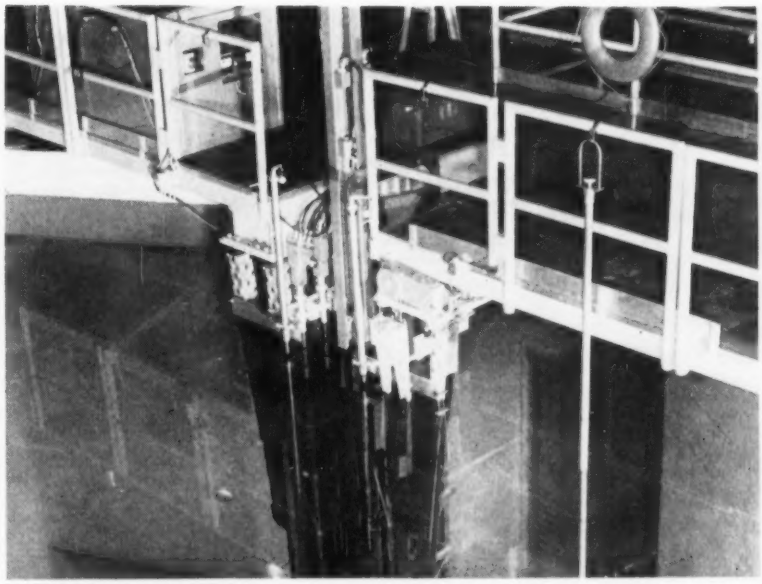
▪ Chromate conversion coatings play a triple role in the Naval Research Laboratory's pool-type reactor facility near Washington, D. C. They "passivate" submerged aluminum parts against water corrosion and keep down galvanic action where dissimilar metals meet. At the same time, they improve paint adherence.

Preventing corrosion is vital. Any corrosion products dissolved in the pool water would promote galvanic cell action. This would attack the thin aluminum cladding of the fuel, and might pierce it.

Radioactive product elements would then dangerously contaminate both the pool and the air.

Where It's Used — Allied Research Products, Inc., Baltimore, supplied the coating to the NRL. Many of the surfaces finished with the material, Iridite No. 14-2, are in the "core" of the reactor. This is the part of the installation which contains the fissionable material, Uranium 235. For safety, this core is kept immersed in a 40 x 26-ft pool of water, 20½ in. deep.

Water in the pool is demineralized to a level of about 0.2 to 0.4 ppm total to minimize corrosion. It is interesting to note that the chromate coating on the core assembly itself is not noticeably affected by the neutron bombardment, and may protect indefinitely.



SUBMERGED VIEW: Many structural members of this reactor core assembly are aluminum, finished with a chromate conversion coating.

Why Aluminum? — There are several reasons for using aluminum for these parts. For one thing, exposure to radiation causes little physical change in aluminum, as it may in other metals. Again, unlike many metals, aluminum does not become appreciably radioactive when exposed to neutrons. Finally, aluminum cannot, as many metals can, absorb neutrons, which would require more uranium fuel and would reduce the neutron flux available for research.

Aluminum has worked out so satisfactorily at the operating temperature of the reactor that even the atomic fuel itself is now clad with a 0.02 in. thick layer of aluminum. This is also treated with a chromate conversion coating.

Other Uses—Besides its application to underwater core supports, the same finish finds use on various access doors leading into the pool below the water level. Most of these aluminum surfaces are painted, or will be. The chromate conversion film serves for both corrosion protection, paint adherence.

The coatings fit in again in connection with shield assemblies. Located at one end of the pool, a shield assembly serves two purposes. First, it contains the radiation from the atomic reaction inside the core, as does the water on the other side of the shield. Secondly, it provides access to neutron bombardments through use of beam ports, for use in physics research.

Galvanic Action — Beam ports consist of holes cut through the shield, into which aluminum casings are inserted. Chromate conversion coatings protect these casings. They also minimize galvanic corrosion where aluminum meets other metals.

Three-Factor Plan Simplifies Job Evaluation

By M. A. Barone, Management Service Specialists, Upper Darby, Pa.

Setting up a job evaluation plan takes a lot of time. So do the confabs that go with it.

If you're rating average jobs with the customary 11 factors, try this new three-factor plan instead.

It's much quicker and surprisingly accurate. Workers like its simplicity.

▪ When it comes to installing a job evaluation plan at your plant can the time element be reduced in any way? What's more, can you cut down time spent at the conference table discussing job content with union and supervisory personnel?

The answer to both questions is yes—if you use just three selected factors in rating jobs, instead of the 11 required in many job evaluation plans. For rating most jobs, all you need are the basic factors of Trade Knowledge, Job Proficiency and Hazards, as listed in Table I. With just these three, you can obtain remarkable accuracy in rating jobs by classes and by scores.

The three-factor point system works best in light or medium manufacturing or assembly operations. A reserve squad of four additional factors should be added to this short-cut technique for foundries, large fabricating plants and other operations where a majority or large minority of the jobs are out of the ordinary.

For Rougher Jobs—Crane operators, explosives handlers, spray-booth painters and foundry workers would be typical examples of these out-of-the-ordinary job classifications. In such cases, you'd supplement the three basic rating factors with these four, also shown in Table 1: Working Conditions, Physical Effort, Safety Responsibility and Responsibility for Instructing Others.

As already indicated, the prime advantage of the basic three-factor plan is the time it saves, either at the bargaining table with union officials, or in discussion sessions with supervisory personnel or non-union office workers. It stands to reason that three factors can be considered and resolved in much less time than 11.

That's Not All—Simplifying a rating system down to just three basic factors also makes things much clearer and advances everyone's understanding of what goes on. For example, word always gets back to the work force of the elements under discussion. But there will be less suspicion of the "new system" when fewer elements are involved and much of the usual complexity about job rating is pared down.

By way of defining the three basic factors in the new plan, the Trade Knowledge element is an appraisal of what educational background or other knowledge is needed on the job. It rates a worker's schooling all the way—from the amount needed to read, write and carry out simple verbal or written

TABLE 1 **Basic and Supplementary Job Factors**

3 Factors in Basic Plan	Degrees										
	1	2	3	4	5	6	7	8	9	10	11
Trade Knowledge	30	43	55	67	74	90	101	120	135		
Proficiency	47	50	56	62	68	86	112	124	144	162	180
Hazards	27	54	81	108	135						

4 Factors to be Rated for			Degree		
Above-Average Jobs	Base	1	2	3	4
Physical Demand	Base	11	22	44	
Safety of Others	Base	10	20	30	
Work of Others	Base	5	10	15	20
Working Conditions	Base	11	22	44	

Score Range	Grade
139	Base
140–161	11
162–183	10
184–205	9
206–227	8
228–249	7
250–271	6
272–293	5
294–315	4
316–337	3
338–359	2
360–381	1

instructions right up to top levels. It also rates self-study courses, job experience and/or trades training.

The Proficiency factor appraises the length of time required for an individual with specific training to perform as expected and in a responsible manner under normal supervision.

The Hazards factor appraises the probable adverse effect of job environment on the worker. These hazards include recognized occupational injuries.

It Checks Out—Proof of the rating accuracy of the three-factor plan has been established by matching it with the National Electrical Mfr.'s Assn. and National Metal Trades Assn. plan which uses 11 factors. It compares so closely, in fact, that you can use the same score range. The probability of the same grade prediction is very high, also, as is shown in Table 2.

Table 3 ranks job classifications by points in matching the NEMA-NMTA plan against the basic three-factor method.

A random sampling of these machine shop and foundry jobs was checked out according to Spearman's rank difference formula* to correlate the three-factor plan with the eleven-factor rating method. The rank correlation coefficient was calculated to be 0.977, which is remarkably close to the perfect correlation score of 1.

The simplified plan does not sacrifice accuracy of job grades. Inasmuch as the jobs emerge in relative order by score rating, it is sufficiently close for all practical purposes. Time required to install such a plan is less; cost is lower also.

Naturally, persons rating jobs according to the new plan will need some training and instruction. Thus equipped, however, raters should be able to arrive at the same acceptable grade patterns obtained with other job rating plans.

* $\rho = 1 - \frac{6\Sigma\,(D^2)}{N\,(N-1)}$, where ρ = Rank correlation coefficient, D = Difference of ranks, N = No. of cases in each rank.

TABLE II

Job Classification	NMTA/NEMA Plan		3-Factor Plus Base Plan	
	Points	Grade	Points	Grade
Tool Master	381	1	372	1
Tool Maker-A	347	2	344	2
Machinist Maint.-A	340	2	347	2
Molder-Floor & Pit-A	329	3	342	2
Vert. Boring Mill Op.-A	316	3	315	4
Assembler Erect.-A	326	3	330	3
Lathe Operator-A	311	4	300	4
Molder-Floor-A	305	4	295	4
Molder-Bench-A	300	4	301	4
Coremaker-Floor-A	302	4	304	4
Carpenter-A	304	4	304	4
Planer Operator-A	311	4	315	4
Millwright Maint.	280	5	279	5
Cupola Tender	288	5	287	5
Punch Press Operator-A	281	5	282	5
Milling Machine Op.-A	279	5	283	5
Grinder External-A	289	5	283	5
Crane Man	250	6	257	6
Coremaker-Bench	258	6	263	6
Chipper	256	6	261	6
Grinder-Centerless	266	6	270	6
Truck Driver	242	7	245	7
Shipping Checker	215	8	215	8
Industrial Truck Op.	204	9	206	8
Laborer	170	10	180	10

TABLE III

Rank	NMTA-NEMA Classification	Points	Rank	3-Factor Plus Base Classification	Points
1.	Tool Master	381	1.	Tool Master	372
2.	Tool Maker	347	2.	Machinist Maint.	347
3.	Machinist Maint.	340	3.	Tool Maker	344
4.	Molder-Floor & Pit-A	329	4.	Molder-Floor & Pit-A	342
5.	Assembler Erector-A	326	5.	Assembler Erector-A	330
6.	Boring Mill Op.-A	316	6.	Boring Mill Op.-A	315
7.	Lathe Op. Engine-A	311	7.	Planer Op.-A	315
8.	Planer Op.-A	311	8.	Coremaker-Floor-A	304
9.	Molder-Floor-A	305	9.	Carpenter-A	304
10.	Carpenter-A	304	10.	Molder-Bench	301
11.	Coremaker-Floor-A	302	11.	Lathe Op. Engine-A	300
12.	Molder-Bench-A	300	12.	Molder-Floor	295
13.	Grinder-External-A	289	13.	Cupola-Tender	287
14.	Cupola Tender	288	14.	Punch Press Operator-A	282
15.	Punch Press Operator-A	281	15.	Milling Machine Op.	283
16.	Millwright Maint.	280	16.	Grinder External-A	283
17.	Milling Machine Op.	279	17.	Millwright Maint.	279
18.	Centerless Grinder	266	18.	Centerless Grinder	270
19.	Coremaker-Bench	258	19.	Coremaker-Bench	263
20.	Chipper	256	20.	Chipper	261
21.	Craneman	250	21.	Craneman	257
22.	Truck Driver	242	22.	Truck Driver	245
23.	Shipping Checker	215	23.	Shipping Checker	215
24.	Industrial Truck Op.	204	24.	Industrial Truck Op.	206
25.	Laborer	170	25.	Laborer	180

How Long, How Fast To Heat Tool Steel

PART II

More basic pointers on the heating rate of tool steels—especially the effects of shape, furnace atmospheres, circulation, molten media, and steel analysis.

All are important to some degree. And all can help improve your heat treating practice.

■ As the previous article in this two-part series pointed out, both the initial furnace temperature and the surface condition of the tool influence the rate at which tool steels heat. Both variables were carefully checked by Carpenter Steel Co.'s Metallurgical Research Laboratory in a recent test program.

Size also affects heating rate. It takes longer to heat a big piece than a small piece. You can tell more about the size factor by studying the results obtained when four different size rounds of water hardening steel were placed, with thermocouples attached to the centers, in an electric furnace heated to 1450°F.

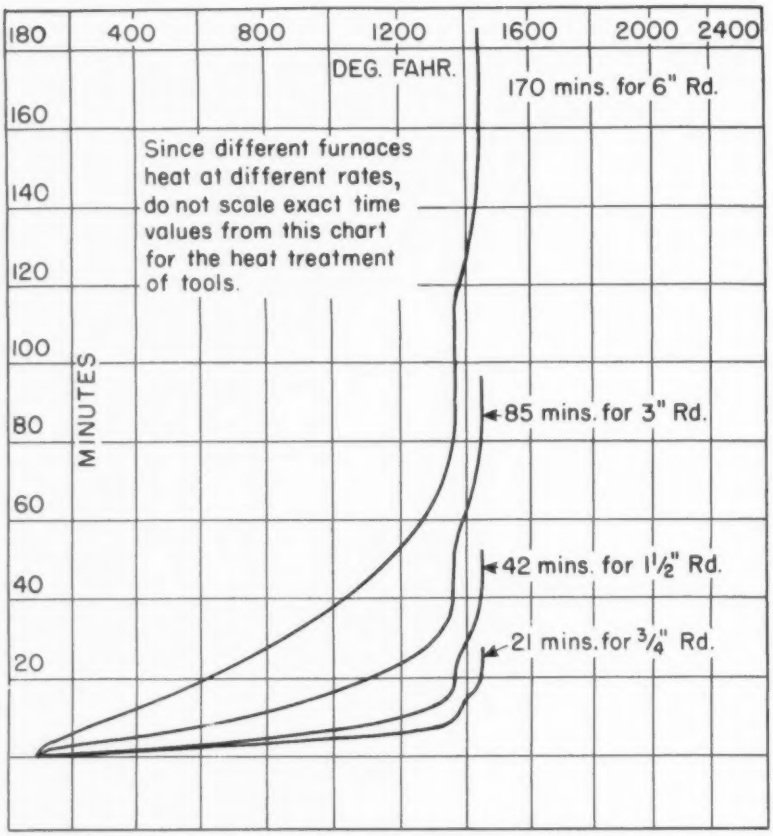


FIG. 1: How size affects heating time of water-hardening rounds.

Different Diameters—The resulting chart, Fig. 1, shows that the 1½ in. round took twice as long as the ¾ in. round. The 3 in. piece took twice as long as the 1½ in. piece. And the 6 in. round again doubled the time.

This indicates that the time required to heat a solid cylinder is directly proportional to its diameter. The rule applies for all temperatures.

The conclusion on size does not mean that you can allow so much heating time per inch of thickness because a 1 in. sphere, a 1 in. cylinder, and a 1 in. plate heat at entirely different rates.

Shape's Important — A finished tool may turn up in a variety of detailed shapes. But most of them are likely to have a general shape resembling a cylinder, cube, or rectangle. Since all the data so far has been for cylinders, this shape shall be used as a basis for comparison.

An accurate comparison can be arrived at by heating a 1½ in. round bar with three different flat bars 1½ in. thick. With thermocouples at the center of each piece, they are heated to 1450°F in an electric furnace.

Some Rates Vary—Notice in Fig. 2 that the 1½ in. square and the 1½ in. round heat at exactly the same rate. The wider flats take longer as indicated by recordings shown in Table 1.

The 1½ in. by 3 in. heats 70 pct

■ **This is the second article of this two-part series. Part I, which dealt with the effects of initial furnace temperature and surface condition on the heating rate of tool steels, appeared in the April 4 issue.**

as fast as the 1½ in. round, while the 1½ in. by 6 in. heats 58 pct as fast as the 1½ in. round. By actual tests, ratios have been worked out that can be applied for all simple shapes (Fig. 3).

To use this information, you must first know how long it would take a cylinder to heat under the conditions at hand. Then—to determine the time for other shapes—divide the time of the cylinder by the speed factor for the new shape.

Internal Structure — Tests show that internal structure does not affect the heating rate for tool steel. This opposes the general belief that a piece of tool steel, after oil treating or even normalizing in air, heats faster than when it is in the annealed condition.

Evidently, here's what happens:

Take two similar machined specimens of annealed water hardening tool steel. Oil treat (quench) one piece from 1550°F, and then put both pieces into a furnace heated to 1450°F. The oil treated piece definitely heats faster than the annealed piece. But this is not due to the difference in structure between the pieces.

Surface Differences — The fast heating of the oil treated piece is due to its black surface. The slowness of the machined piece is due to its bright surface. This principle was borne out earlier.

To prove that this "faster heating" of an oil quenched piece is not due to structure, you need only polish both pieces before comparing their heating speeds. With the same surface finish on both pieces, they will heat alike—despite differences in structure.

Discount Atmosphere—Composition of the furnace atmosphere appears to have no effect on the heating rate of tool steel within the temperature range investigated. Furnaces fired with gas or oil can be operated all the way from definitely oxidizing through neutral, to defi-

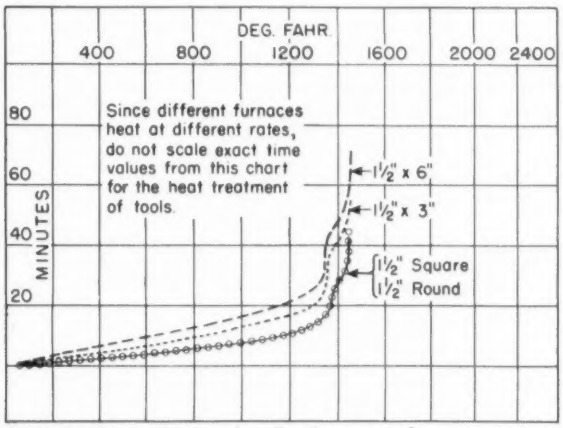


FIG. 2: Times for heating flat bars are shown.

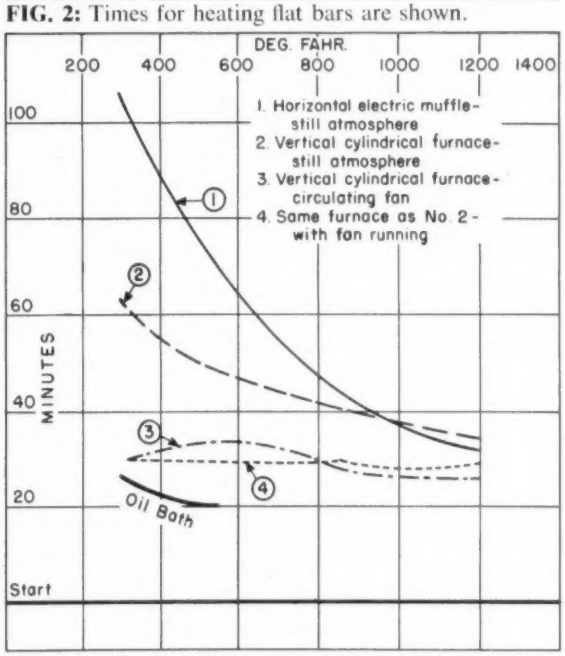


FIG. 4: Curves for 1½-in. round under four furnace conditions.

How Shapes Affect Heating Speeds

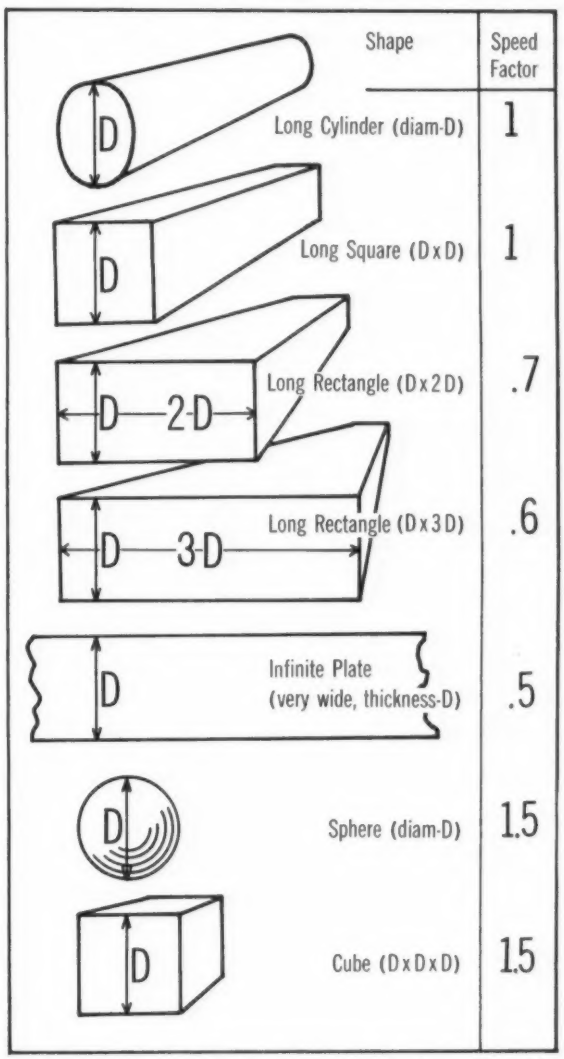


FIG. 3: Relative heating speeds break down like this.

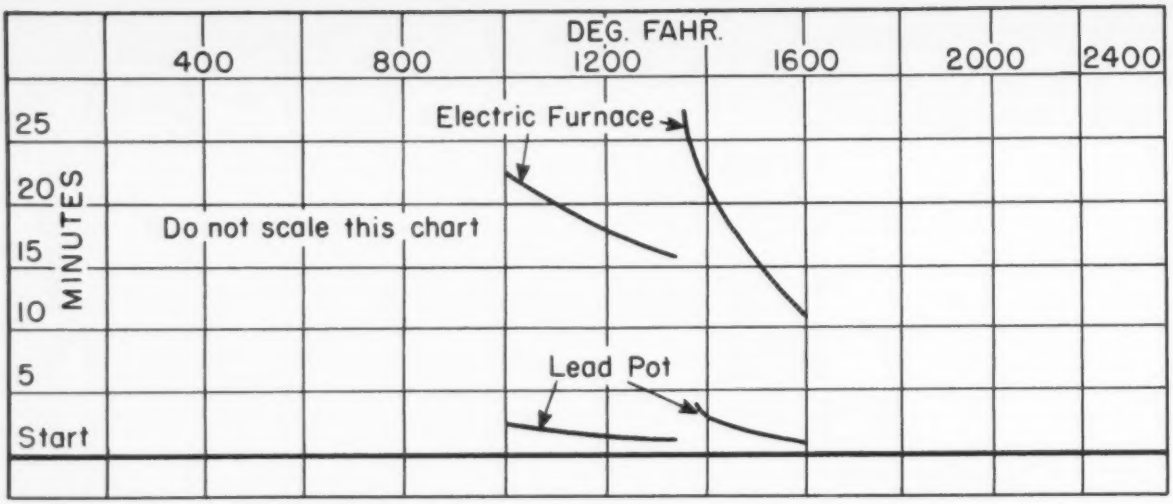


FIG. 5: Relative heating times of ¾-in., bright-surface steel round in lead pot and furnace.

nitely reducing. The same thing can be done in modern atmosphere-controlled hardening furnaces.

Extensive tests were run in a gas-fired, semi-muffle furnace and in a gas-curtain, atmosphere-controlled electric furnace. Specimens of water hardening, high carbon steel, high-speed steel, and high-carbon high-chromium steel were used.

Results are summarized in Table 2. Any variation you may encounter in these or similar tests is likely to stem from the absence of circulation in the furnace.

Check Circulation—Circulation of furnace gases can have a very important effect on the total time required for a tool to come up to heat. As a starting point, consider the three different degrees of circulation obtained in a high temperature furnace used for hardening:

A) Muffle-type furnace with stagnant atmosphere — practically no circulation.

B) Muffle-type furnace with controlled atmosphere—lazy circulation.

C) Fuel-fired, semi-muffle type furnace—active circulation.

Readings taken from Table 2 for 1½ in. round water hardening steel at 1450°F under these three conditions show the following total heating time: A) no circulation—50 minutes; B) lazy circulation—38 minutes; C) active circulation—30 minutes.

Tempering Temperatures—In the low temperature range, hot air ovens such as those used for tempering or drawing offer two degrees of circulation: A) ovens with stagnant atmospheres—practically no circulation; B) ovens with mechanical fans—extremely active circulation, depending on the fan speed.

Table 1 Shape vs. Heating Time

Size and Shape	Heating Time
1½" round	36 minutes
1½" square	36 minutes
1½" x 3"	51 minutes
1½" x 6"	62 minutes

Shown in Fig. 4 are the heating curves for 1½ in. round water hardening steel under four different furnace conditions. It is interesting to note that the two ovens with circulating fans heat the steel in about the same time—regardless of temperature.

For tools that are tempered below 500°F, there is much time-saving benefit in using tempering ovens with circulating fans for production work. Advantages multiply with work-loaded furnaces.

Lead Pot Results—When a cold piece of tool steel is hung in a lead pot, it quickly chills the lead in its immediate vicinity. If the piece is large or the pot small, it will chill the whole pot. Heating the lead back to temperature takes an appreciable amount of time. To a great extent, this disturbs any effort to measure the exact time required to heat the steel.

Knowing this and the fact that tools hardened in a lead pot are usually of small cross-section, tests were run on a piece of water hardening steel ¾ in. round by 6 in.

Lead Faster—A thermocouple was attached in a manner that would assure the most accurate reading possible. The resulting chart, Fig. 5, shows a curve for heating in both a lead pot and in an atmosphere-controlled electric furnace. You can see that the steel

heats about 6 to 10 times as fast in the lead as it does in the furnace.

From a practical standpoint, the results obtainable in molten salt should be comparable to those obtained in lead.

Oil Tempering—An oil tempering bath heats somewhat faster than a hot air oven with a circulating fan. But fast as the oil bath is, it is doubtful whether it could maintain all this advantage over a fan-driven hot air oven when tempering a basket-full of small parts. The recommended values given in Table 3 for tempering furnaces should prove useful and fairly accurate.

Keep in mind that after the tool reaches the proper tempering temperature, it should be soaked at heat to let the internal changes take place. Carpenter's torsion impact curves are all based on soaking one hour at heat. Large or intricate tools should be soaked longer than one hour.

Cut Time—As a general rule, the drawing temperature should be reduced 20° to 25°F every time you double the soaking time over one hour.

After laboratory testing a matched set of tool steels, it can be concluded that the analysis of the steel does not appreciably affect the rate at which it absorbs heat from the furnace. Since the heat conductivity of all tool steels is about the same, there is no difference in the rate of heating under the critical.

Note Critical—Steels with different analyses, however, have critical points that fall at different temperatures. It is only in heating through the critical temperature range that the analysis influences the heating time.

In careful practice, this effect is negligible because the expert heat treater will harden at temperatures that avoid the critical or blind spots in steel. For this reason, the analysis has practically no effect on the heating time.

Table 2 EFFECT OF FURNACE ATMOSPHERE ON HEATING TIME

(All pieces 1½ in. round x 3 in. long—thermocouple at center)

Type of furnace	Atmosphere CO_2	Atmosphere O_2	Atmosphere CO	Description	Water Hardening 1.10% carbon tool steel heated to 1450°F	High Speed 18-4-1 high speed steel heated to 1600°F	Oil Hardening high-carbon high-chrome tool steel heated to 1600°F
Gas-fired semi muffle	7.8%	3.7%	0.0%	Oxidizing	30 mins.		
	10.0	0.0	0.5	Neutral	31 mins.		
	7.5	0.0	4.3	Slightly reducing	30 mins.		
	4.8	0.0	8.1	Reducing	29 mins.		
Electric muffle, controlled atmosphere	0.0	20.0	0.0	Room atmosphere	50 mins.		
	7.3	9.5	0.0	Oxidizing	39 mins.	28 mins.	24 mins.
	13.5	0.0	0.0	Neutral	37 mins.		
	10.3	0.0	5.2	Slightly reducing	38 mins.		
	7.5	0.0	9.9	Reducing	38 mins.		
	5.5	0.0	12.3	Very reducing	.....	27 mins.	24 mins.

EFFICIENT HEATING: Circulation of furnace atmosphere has a lot to do with how fast steels heat. Examples are listed in Table 2. Table 3, provides a thumb-nail guide to help you in tempering.

Table 3 APPROXIMATE HEATING TIME FOR TEMPERING

(Per inch of diameter of thickness, steel having dark or scaled surface[1])

Tempering temperature	Time required (per inch) to reach furnace temperature: In a hot air oven, without circulation — Cubes or spheres[3]	Squares or cylinders[3]	Average flats[3]	In a circulating air oven, or an oil bath[2] — Cubes or spheres[3]	Squares or cylinders[3]	Average flats[3]
250°F.	30 mins.	55 mins.	80 mins.	15 mins.	20 mins.	30 mins.
300°	30	50	75	15	20	30
350°	30	50	70	15	20	30
400°	25	45	65	15	20	30
500°	25	40	60	15	20	30
600°	25	40	55	15	20	30
700°	20	35	50	15	20	30
800°	20	30	45	15	20	30
900°	20	30	40	15	20	30

Temperatures above 900°F are visible—watch the color

[1] The figures apply to a dark or scaled surface on the tool. If the tool surface is finish ground, or otherwise brightened allow double time in a still hot air oven. No extra allowance need be made for bright surfaces in a circluating oven, or in an oil bath.

[2] An oil bath can be used only at the lower temperatures.

[3] See Fig. 2 and Fig. 3.

In-Plant Continuous Plating Line Silvers Wire Faster

When is it worthwhile to stop "farming out" work and bring it under your own roof?

This company weighed work volume, quality, cost considerations — decided the balance favored bringing work in-plant.

Results from the continuous system installed have more than justified the decision.

■ Bringing a wire-plating operation in-plant, and making it continuous, has solved a critical silver-plating problem for the Wilbur Driver Co., of Newark, N. J. The new system makes plating more uniform. Cost is less than when the job was subcontracted, and the company keeps better control over delivery schedules.

Fully automatic, the system draws four strands of 0.036-in., manganese-nickel wire at a time off a takeoff stand. It takes them through 12 cleaning, plating, rinse and drying tanks, then rewinds them. Wire comes out with a 0.0009-in. nickel-silver deposit.

Plating rate is 20 feet of wire per minute or better.

Previous Method—Wilbur Driver had an outside processor silver-plate the wire, which is used in electron tubes, before they decided to go over to the continuous in-plant system. The outside firm had plated the wire by a spiral method, immersing large coils of wire in solutions in a rotating process. One difficulty with this system was that outside surfaces of large immersed coils were picking up an excessively heavy coating, while inner surfaces sometimes received little or none.

This presented a critical problem for Wilbur Driver when the plated wire was drawn down to 0.002-0.007 in. diam in a subsequent operation. Non-uniform deposits of silver meant the wire wouldn't meet required specifications.

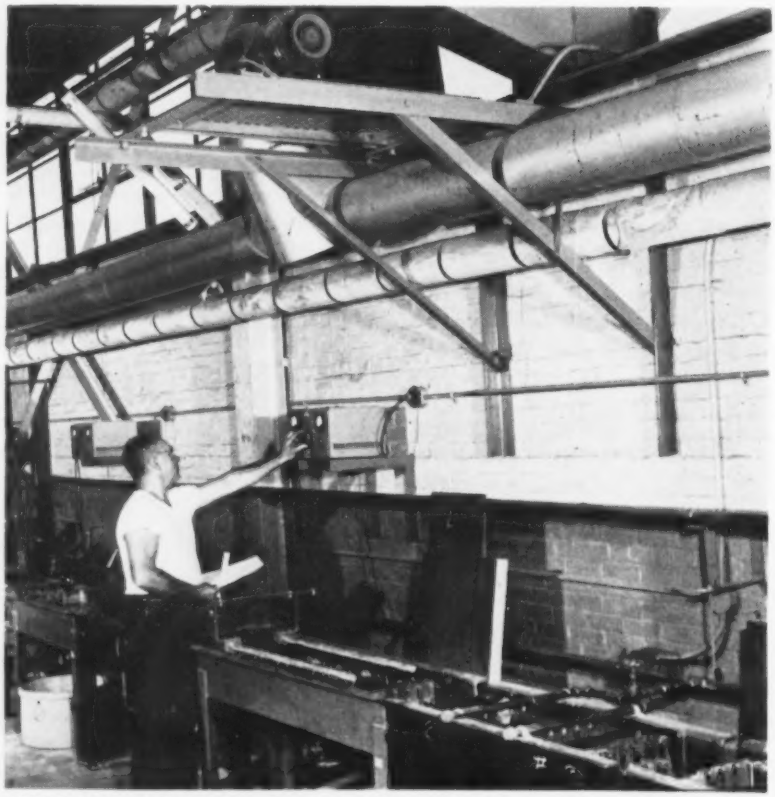
No Problem Now—The system designed and installed by Hanson-Van Winkle-Munning Co., overcomes this. So far, it's been used only for silver plating. But by changing the three plating tanks in the system, it could as easily be used for other wire-plating operations, within the limits of rectifiers and other control elements.

Rated speed of the system is 5 fpm for each line of wire. Thus, wire moves through the complete system in about 10 minutes.

Both speed at which the wire moves through the system and the plating thickness can be controlled. Changing a variable drive 2 hp motor at the unload station varies speed between 2 and 14 fpm. Plating thickness is changed for various products either by speeding up or slowing down the wire or by adjusting current.

Step-By-Step—Wire follows this sequence in plating:

(1) Cleaning tank: Wire is first cleaned in an electrolytic bath for 30 seconds. A high caustic-silicate heavy duty electro-cleaner is used, in a solution of 8-12 oz per gallon of water. Temperature is held at 180°F by a Powers regulator. An



STEPLESS CONTROL: Operator adjusts selenium rectifier at nickel strike tank. Ventilator system draws off offensive fumes.

exhaust duct draws fumes off to an outside air vent.

(2) Spray rinse: Cleaner is rinsed off wire in a spray rinse tank. This could be converted to a soak rinse if necessary by closing the tank's drain.

(3) Electro pickle: Wire is again cleaned in a sulphuric acid pickle, 65 pct by volume, for 30 seconds.

(4) Spray rinse: 30 seconds.

(5) Nickel strike: A thin coating of nickel is plated on the wire in a nickel chloride solution at 50 amps per sq ft, room temperature, for 45 seconds.

(6) Spray rinse: 30 seconds.

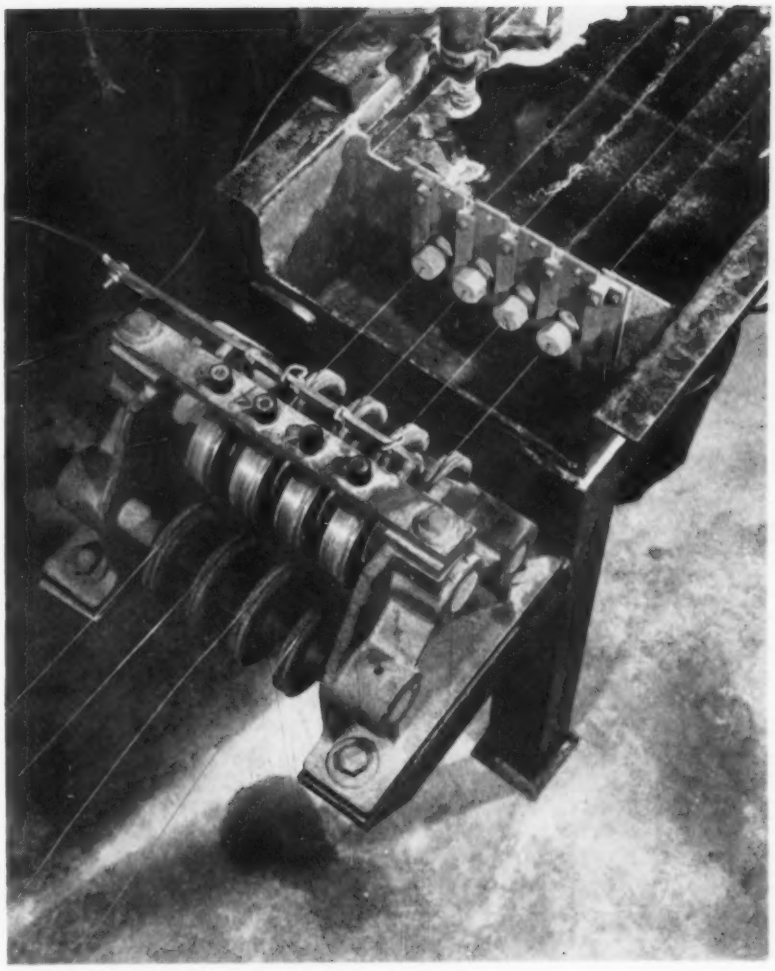
(7) Cyanide dip: Wire is immersed in a potassimum cyanide solution, 2-4 oz/gal of water, at room temperature for 30 seconds.

(8) Silver strike: A thin coat of silver is applied to the wire, to provide better surface adhesion for the heavier coating. Silver cyanide is applied for 45 seconds at 45 ASF.

(9) Silver Plating: Main plating tank is 11½ ft long, providing a plating period of about two minutes. Silver cyanide solution is continuously filtered through an industrial filter unit, then pumped back into the tank. Temperature is held at 100-110°F.

(10) Spray rinse; 30 seconds.

(11 & 12) Soak rinse and dryer: Wire is immersed in hot water held at 160-180°F, to speed drying operation in the final tank.



BETTER CONTACT: Grooved contact sheaves shown rotate with wire, make continuous contact for steady current flow into electro-cleaning tank. Note leak-proof tank seal mechanisms.

Wrap It Up—After drying, wire is rewound on large rewind spools similar to the take-off spools at the beginning of the line. Five individually-clutched heads draw the wire through the system.

Hansen-Van Winkle-Munning has incorporated several features new to the continuous plating system in Wilbur Driver's setup. These show up in contact and seal units, in selenium rectifiers, and in a new drying system.

Three sets of circular sheaves—two idler and one contact for each of the four wires—carry current from the rectifier into the wire. These sheaves operate at the same speed as the wire is traveling. This maintains a constant contact and current supply. Earlier, stationary contacts produced a dragging effect. Also, current supply was inefficient and contacts were short-lived.

Seals Lift—Every tank has leak-proof seals at all wire entrance and exit points. These are mounted on sliding gibs. This permits raising them above the solution level in the tank if wire is not being run through that line.

Heavy duty, self-contained type selenium rectifiers provide stepless power control over full current range at any of the five electrolytic tanks in the system. This permits current changes to be made during a plating operation or for different operations. Each unit is installed directly over the tank it services.

Drying Details—The twelfth tank contains a forced air drying system to prevent spotting of the wire after plating. The lower tank compartment contains a heating coil, the upper section is divided into four small tunnels through which wire passes.

Air forced over the coil and heated to 200-250°F then blows through the tunnels in opposite direction to the incoming wire. A hot water soak rinse was used previously to speed drying.

All tanks in the system are made of double electric welded steel, fabricated from ¼-in. plate, with angle iron rim at top and necessary drain and overflow facilities.

How To Troubleshoot On A New Shell Molding Line

By **H. H. Macler**—President, The Drake Mfg. Co., Inc., Friendship, N. Y.

Like many casters, you're probably toying with the idea of getting into shell mold casting.

You know its advantages, but worry about investing in a process new to your shop.

New equipment, new methods—both spell trouble, at least at first. This small caster tells what he ran into, what he did. You can profit by his experience.

▪ Shell mold casting has its own set of peculiarities. So you may expect some difficulties in starting up a new line.

When switching from sand to shell molds, these troubles will show up in many ways. Anticipate production problems in the early stages, and such casting defects as (1) shrinkage, (2) porosity and (3) run-outs. Make sure you allow enough time in delivery promises to overcome these difficulties.

In troubleshooting shell molding setups, you'll lean heavily on the experience of material and equipment suppliers. Their representatives give excellent and indispensable service. But don't expect them to do all your work.

Numerous situations will arise best solved by you alone. You'll learn that tests sometimes must be run over and over again before any definite conclusions appear.

Get Answers—Then, as it often does, the answers begins to come. Problems get solved, and things go smoother. You will look back and wonder what you were shouting about.

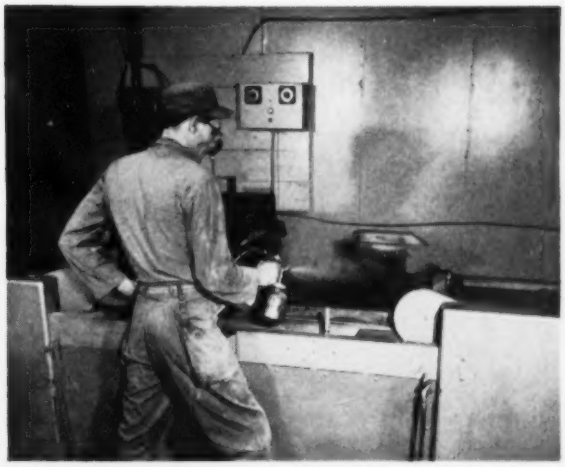
Take Drake Mfg. Co., for example. The Friendship, N. Y., founder first considered shell molding in late 1956. It managed to cast in shell molds only three days after receipt of equipment. But it took four months longer to iron out all the kinks in the production line.

MULLER: Coated sand setup costs more than dry mixer, but uses less resin. It cycles 20 minutes, then dumps through a shaker.

The job shop caster now is well satisfied with the results. Its first customer for shell cast parts is pleased too. This customer found shell molded parts machine faster, due to (1) the smaller machining allowance, and (2) casting uniformly. Surface finish and cost also proved acceptable.

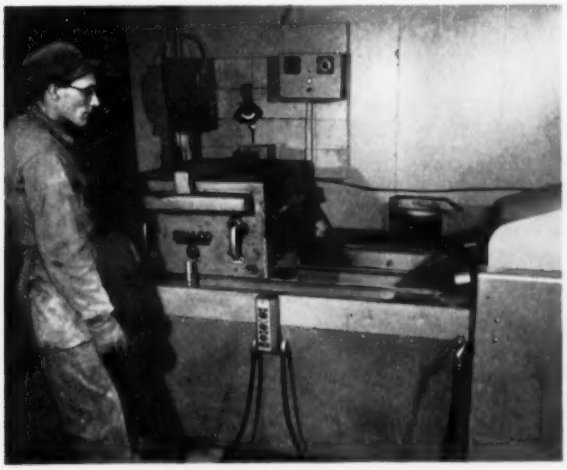
Earlier Setup—About 50 workers at Drake produced earlier 250 tons monthly of smaller-sized gray iron castings on both production and semiproduction lines.

Drake foundry figured to gain in several ways from shell molding: (1) It could use men with less prior training than needed of the average squeezer molders and bench coremakers. (2) If properly mechanized, shell molding would improve working conditions. Workers would get more done with less physical effort. (3) Shell cast parts would compete in price with sand

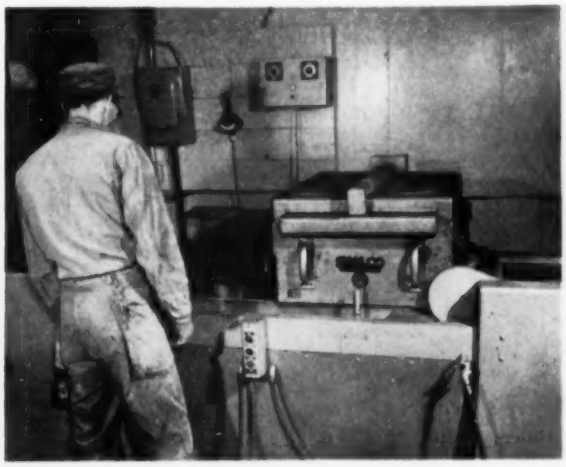


NO STICKING: Spray Carnauba wax emulsion on pattern every five molds to prevent sticking of shell. Another shell is baking in left half of machine.

FLOPOVER: Ten-impression pattern flips atop dump box then turns over to invest shell for 26 seconds. Pattern contains 10 impressions.



MELTS RESIN: Eight 1250-w heaters keep 180-lb pattern at 475°F. Output is 300 shells in 8 hours.



BAKING: Shell bakes 40 seconds while mating half invests. They move immediately to bonding machine.

castings. And (4) it could expect to increase casting output about 40 pct. You can expect similar benefits.

As a first step in getting into shell mold casting, you should look over your customer list. Find and approach one that buys large numbers of production castings. Point out to the customer what he will gain from shell cast parts.

Firm Order — Drake Mfg. did this, and landed an order for pattern equipment and a large number of castings. These castings required pressure tightness and close tolerances: ±1/64 in. on many dimensions, and 0.040 in. machining allowance on most surfaces. The customer machined the parts on automated equipment.

With a firm order to back you up, list and select needed shell molding equipment and supplies. Some equipment you will buy. Some you can design and build yourself.

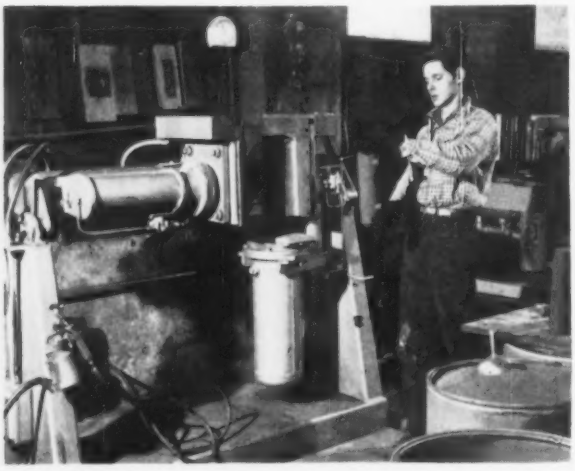
Chances are your experience to date with shell molds is meager. To compensate for this lack, try making shell cores first. You may adapt metal core boxes to make shell cores, as Drake did.

Shell cores reached Drake's production line within three days after delivery of the first core making machine. Presently, nearly one-third of the cores produced come from its two machines. One man operates both. He was hired at the time the machines were installed, with no prior foundry experience.

Mulling Sand — McConnellsville sand of AFS 80 fineness is used for both shells and cores. To 400 lb sand in the muller, Drake workers add 16 lb resin. After mulling 1 minute, 58 oz alcohol and 19 oz

BONDING SHELLS: Resin dusts through template on still-hot shells. Shells are pressed together and edges fuse. Completed molds weigh 23½ lb each.

TIERED MOLDS: Bedding sand separates layers of poured shells. Bushed-out sand is recovered, reused. Four mold layers are generally built up.



CORE MAKING: One man handles both core-making machines, turns out one-third of all cores used. Time cycle for core averages 75 seconds.

Shell Molding Checklist For Foundrymen

YES/NO	Ample background in pattern making, mechanics, metallurgy and foundry practices to overcome operating problems.
YES/NO	Financially able to buy good shell molding equipment.
YES/NO	Financially able to face extended experimental period, with little or no return on shell molding investment.

water are poured in the mix. Two minutes later, a gas-heated blower-fan cuts in. It blows air at 140°F. through the sand mix. Total cycle time is 20 minutes.

In switching from sand to shell molds, you may have trouble with runner and gating design. At first, Drake made both too large. So metal entered the casting cavities too fast. The firm reduced the size of both ingates and runners several times before solving its problem.

You may also get involved with runouts. This was Drake's greatest difficulty. Shells cracked about 20 seconds after filling with molten iron. Runouts resulted. You can avoid cracked shells by properly adjusting shell molding cycle and pattern temperatures, as Drake did.

Shrinks—Difficulties described so far will show up in many foundries. But there also will be troubles peculiar to the casting job at hand. Drake ran up against intermittent surface shrinks that proved tough to get rid of. The usual remedies didn't work. Shrinks formed at a point not readily accessible by a feeder.

Flipping the entire shell mold over solved the problem. That meant pouring the mold with the former drag side up. To do this, the entire gating system was switched.

First sample parts passed layout inspection. But they failed machining tests. The customer found the reduced finish allowance on the shell castings threw off his reference points for machining. There was a 3-week delay while the customer changed the locators on his automatic machining setup. Drake now is in full production.

OUT OF THE SUBS AT SEA

FLY THE AIRCRAFT-QUALITY STEELS* OF . . .

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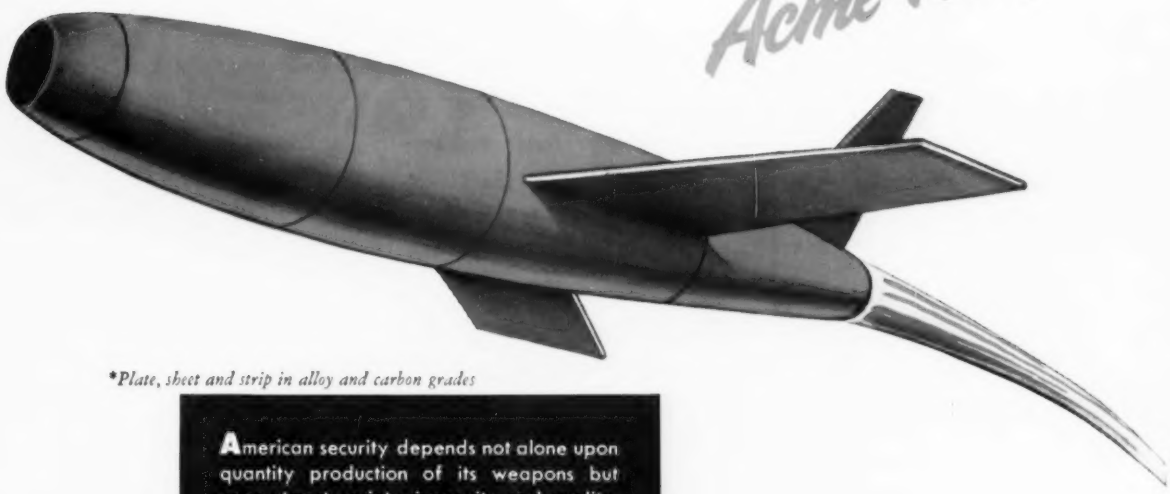

**Plate, sheet and strip in alloy and carbon grades*

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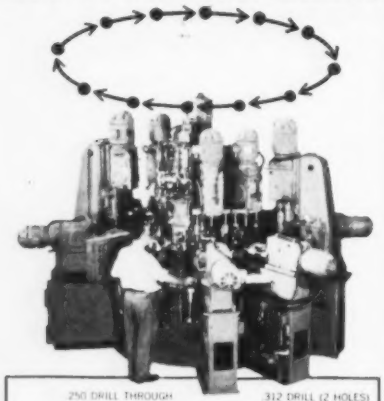

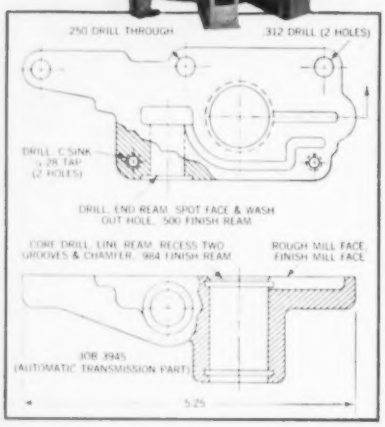

This Kingsbury has a central column and 12 stations, and 13 automatic operating units. Clamping and unclamping are automatic. All units operate at the same time, while the operator is changing parts in the fixture.

Most Kingsburys are less elaborate. But all have the same purpose:
uniform operations
at a high production rate
to the customer's specification
at low unit cost

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KINGSBURY

INDEXING AUTOMATICS for high production drilling and tapping

FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 133.

Oil-tight Pushbuttons

Designed for accessibility of wiring, appearance and flexibility, new heavy duty oil-tight pushbuttons are covered in a 32-page catalog. It lists units rated to 550-v ac-dc. (Furnas Electric Co.)

For free copy circle No. 1 on postcard, p. 133

Polyamide Tubing

Polyamide pressure tubing is described in a 4-page bulletin. It covers outstanding characteristics and installation advantages of the new flexible tubing. The folder also lists available sizes and information on where to advantageously use the tubing. (The Polymer Corp. of Penna.)

For free copy circle No. 2 on postcard, p. 133

Bridge Cranes

A hand traveling crane in capacities of 3 to 10 tons with spans up to 50 ft is shown in a folder. (Wright Hoist Div., American Chain & Cable Co., Inc.)

For free copy circle No. 3 on postcard, p. 133

Magnets

Cast and sintered permanent magnets are presented in a dozen page catalog. It includes information on magnetic and mechanical properties, approximate tolerances, magnet assemblies, sales and service as well as how-to-order—both cast Alnico 5 and sintered Alnico 2 permanent magnets. (Magnetic Materials Section, General Electric Co.)

For free copy circle No. 4 on postcard, p. 133

Small Arc Furnace

Laboratory arc-melting vacuum furnace that simulates conditions in a large production furnace is now available. Literature tells how it works. (Rochester Div., Consolidated Electrodynamics Corp.).

For free copy circle No. 5 on postcard, p. 133

Lubrication

A hydraulic oil data and lubrication guide relates to hydraulic presses. Its contents deal with supervision of hydraulic systems, preventive maintenance, oil specifications, and guide lubrication. (Lake Erie Machinery Corp.)

For free copy circle No. 6 on postcard, p. 133

Liquid Chillers

An engineering specifications catalog covers a series of six, new packaged liquid chillers. Described are units with capacities from 3 through 20 tons. (Acme Industries, Inc.)

For free copy circle No. 7 on postcard, p. 133

Spring Washers

To describe its new compact energy "cartridges"—which consist of pre-assembled stacks of multiple spring washers held together by pins or rivets passing through the washers at or near their neutral axis—a spring manufacturer has published a new 6-page bulletin. The "cartridge" provides a compact unit

which can be incorporated as a one-piece component in a final machine. (Associated Spring Corp.)

For free copy circle No. 8 on postcard, p. 133

Turns Plate

Turning steel plates and shapes in shop or yard is difficult without hoist and crane facilities. A special hand tool to do the job without danger is described in a new leaflet.

Properly used, the tool is said to help cut handling time and costs. (Guibert Steel Co.)

For free copy circle No. 9 on postcard, p. 133

Welding Wire

Many methods of packaging welding wire are listed in a 4-page folder. In addition, the bulletin gives an up-to-date analyses of various stainless steel, low alloy, and carbon steel welding wires. (Page Steel & Wire Div., American Chain & Cable Co.)

For free copy circle No. 10 on postcard, p. 133

Drum, Cam Switches

Eight-page bulletin covers complete line of drum and cam switches for manual and automatic control of wound-rotor, squirrel cage, dc series, and compound-wound motors. It describes features, lists continuous operation requirements; discusses applications. (General Electric Co.)

For free copy circle No. 11 on postcard, p. 133

Automatic Oiler

Servicing and operating of large displacement lubricators are covered in a two-page instruction sheet.

It describes a fully automatic lubricator suitable for bearings, gear trains and clutches within units of machinery, such as large lathes, punch presses and packaging machinery. (Bijur Lubricating Corp.)

For free copy circle No. 12 on postcard, p. 133

Diesel Engines

Incorporation of a production diesel engine into a crawler tractor is described in a new booklet. Also shown is a company's current line

These Oakite shortcuts speed your metal cleaning

1. Cleaning and rustproofing *—in one washing operation.*

Oakite Composition No. 98 (used cold or hot in one-stage or two-stage washing machines) quickly removes cutting oils and chips and leaves a thin film that protects steel against rusting between operations or during temporary storage.

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One auto manufacturer uses No. 98 in seven plants for cleaning and rustproofing brake cylinders, camshafts, connecting rods, crankshafts, cylinder heads, flywheels, push rods, tappets, wrist pins, etc.

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A television manufacturer says "We formerly took 25 minutes to strip rejected cabinets, then had to pickle to remove tarnished phosphate coatings. Today 10 minutes in Rustripper strips the same cabinet so bright and clean you can't tell it from new. Eliminates pickle, neutralize and rinses."

An auto parts maker uses Rustripper for continuous conveyor line stripping. "Cycle of 1 minute and 50 seconds works like a charm stripping paint and incidental rust from rejects and hooks."

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FREE LITERATURE

of diesel engines in various arrangements. These include: industrial power units, self-regulated electric sets, spark-ignition engines designed to burn natural gas as fuel, torque converter units, twin arc-welders and marine diesel engines. (Caterpillar Tractor Co.)

For free copy circle No. 13 on postcard, p. 133

Finish Machine

Basic types of automatic transverse spray finishing machines are illustrated in a new catalog. It covers transverse machines of four types: horizontal straight line, horizontal contour, vertical straight line and vertical contour machines. (The DeVilbiss Co.)

For free copy circle No. 14 on postcard, p. 133

Two-diameter Drills

A recent booklet discusses two types of two diameter drilling. A tool test report contrasts production records of the two methods, and presents initial cost and production savings figures. (Mohawk Tools, Inc.)

For free copy circle No. 15 on postcard, p. 133

Pipe Failure

New illustrated bulletin offers information on how to absorb vibration, dampen noise, reduce piping failure, and prevent leakage. Material specifications, pipe sizes, and fitting connections are shown as well as operating pressures and maximum off-set allowed. (Flexonics Corp.)

For free copy circle No. 16 on postcard, p. 133

Brazing Torch

Four-page brochure describes a burner which produces a sharp, spear-like heating flame. This type of flame is used in brazing, soldering metal manufacturing, and similar fields. The high temperature flame covers a limited area, uses any available fuel gas and air. (Selas Corp. of America.)

For free copy circle No. 17 on postcard, p. 133

2 new ELPAR® Fork Truck Series

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"Safe-Hite" Fork Trucks

These ELPAR electric trucks operate in street trucks, tunnels, basements—wherever limited headroom is a factor. Upright design also permits high stacking in storage. The model pictured, for example, is only 68″ high, yet has a lift of 100″.

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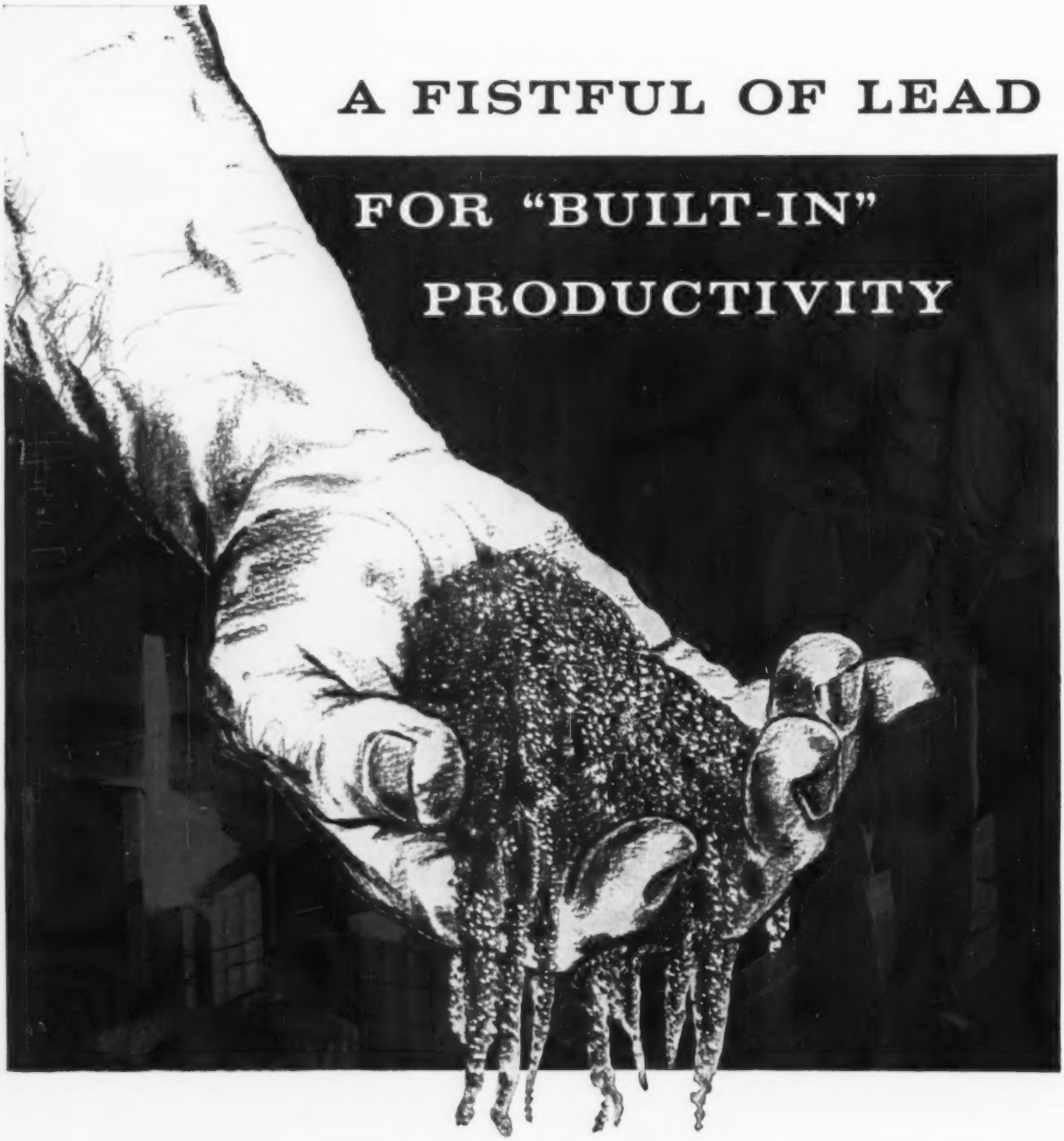
FOR "BUILT-IN" PRODUCTIVITY



Controlled additions of lead, introduced when the ingots are teemed, produce steel with vastly superior machining qualities compared to same steel unleaded. Leaded alloy and carbon are freer machining, permit faster feeds and speeds and greatly increase tool life. They cut clean and with a fine finish which frequently eliminates the final machining operation. These better machining qualities add up to a kind of "built-in" productivity that can mean substantial production line savings for you.

If you would like to see for yourself what "built-in" productivity can mean in your operation, ask us to lead half of your next Aristoloy order. Our field metallurgist is also at your disposal—ready to work with you in selecting the best leaded grade for the job.

For complete information, call the Copperweld office in your nearest major city, or write direct.

ARISTOLOY STEELS

COPPERWELD STEEL COMPANY

Steel Division • Warren, Ohio

EXPORT: Copperweld Steel International Co., 225 Broadway, New York 7, N.Y.

FREE LITERATURE

This section starts on Page 128

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Punch Presses

Four-page leaflet describes punch press features that help insure fast, trouble-free production. (Kenco Mfg. Co.).

For free copy circle No. 18 on postcard

Bases, Lathe Pans

Well-illustrated booklet shows machine tool accessory equipment, including machine bases, covers, guards, lathe pans. (Cincinnati Ventilating Co.).

For free copy circle No. 19 on postcard

Ferroalloys

Technical information for buyers of ferrosilicon, ferromanganese, silicomanganese, ferrochrome, ferrosilicon-chrome, and allied products. (Ohio Ferro-Alloys Corp.).

For free copy circle No. 20 on postcard

Vibration Control

Importance of a strong rubber-metal bond in vibration dampening is explained in 8-page leaflet. (Metalstik Corp. of America).

For free copy circle No. 21 on postcard

Machine Mounts

Oil, acid and alkali-resistant machine mounts absorb vibration and noise. Leaflet describes typical case history of mounts in use. (Clark, Cutler, McDermott Co.).

For free copy circle No. 22 on postcard

Integrating Counter

Bulletin gives details of a remote, integrating, 7-digit counter for use with pneumatic transmission systems. (The Bristol Co.).

For free copy circle No. 23 on postcard

Air-driven Drill

New, heavy-duty, 1000 rpm, pneumatic drill weighing 9 lb is described. Drill develops 22 ft-lb on ½ in. diam spindle. (Air Speed Tool Co.).

For free copy circle No. 24 on postcard

Power Presses, Shears

Illustrated 40-page booklet summarizes data on power-operated machines for plate and sheet metal work. Pocket-sized, it's tabulated for quick reference. (Niagara Machine & Tool Works).

For free copy circle No. 25 on postcard

Dust Precipitators

New 8-page bulletin tells how automation improves dust and fume collection efficiencies. Comparative charts and a block diagram are included. (Research-Cottell, Inc.).

For free copy circle No. 26 on postcard

Refractories

Two new bulletins available describe (1) a castable refractory for service to 3350°F, and (2) a general-purpose, heat-setting foundry patch. (The Chas. Taylor Sons Co.).

For free copy circle No. 27 on postcard

Tractor

Pocket-size reference booklet covers the new tractor line. Tractor specifications, and extra equipment available are included. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 28 on postcard

Band Saws

Specification sheet describes three models of a new band saw line for cutting mild steel, stainless steel and hardened steel up to ¼ in. thick. (W. Whitney Stueck, Inc.).

For free copy circle No. 29 on postcard

Counterborer

Literature describes new two-bladed adjustable counterbore. Equipment is said to help counterbore large diameters to precision tolerances. (R. H. Clark Co.).

For free copy circle No. 30 on postcard

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 4/11/57

Circle numbers for Free Technical Literature or information on New Equipment:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

If you want more details on products advertised in this issue fill in below:

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FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

BUSINESS REPLY CARD

No postage necessary if mailed in the United States

POSTAGE WILL BE PAID BY

THE IRON AGE

Post Office Box 77

Village Station

NEW YORK 14, N. Y.

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FIRST CLASS PERMIT No. 36 (Sec. 34.9 P.L.&R.) New York, N. Y.

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FREE LITERATURE

Spot Welders

New special machine bulletin describes a line of 32 multi-spot and projection resistance welding machines. Information on each welder includes: end product, type of operation, production rate and associated materials handling equipment. Products they can join include automotive parts, appliances, precision instruments, electric motors and basic steel. (Taylor-Winfield Corp.)

For free copy circle No. 31 on postcard

Fork Truck Costs

Latest 16-p. issue of the Lewis-Shepard Lever tells how a company operates and maintains its fleet of 14 fork trucks for only $1.87 a day per truck. (Lewis-Shepard Products, Inc.).

For free copy circle No. 32 on postcard

Transfers Stampings

Data on a portable mechanical transfer unit are given in new literature. The equipment converts any standard press into an automated press for progressive operations. (Sheffield Corp.).

For free copy circle No. 33 on postcard

Moving Freight Cars

Performance report tells how-convertible railway/rubber-tired vehicle is used in plant switching, spotting and hauling operations. One vehicle works only to bring a steady flow of cars to three unloading docks. Another serves as a furnace car puller. A third moves freight and fuel cars. Photos show the vehicles in action. (Whiting Corp.)

For free copy circle No. 34 on postcard

QD Couplings

New bulletin describes field-tested, quick-connect couplings using Teflon seals throughout to handle acids, alkalies, solvents and high pressure steam. (Snap-Tite, Inc.).

For free copy circle No. 35 on postcard

Steel Products

Containing 232-pages, a product and warehouse catalog describes over 700 products available from stock at one company's warehouses located throughout the country. The book index lists 16 categories of special purpose steels, including high speed, tool, stainless, alloy and machinery, available in 16,000 grades and sizes. (For free copy, write on company letterhead to Engineering Service Department, Crucible Steel Co., Box 1558, Pittsburgh 30).

V-belt Life

Simple precautions to prolong the life of V-belts are contained in a 12-page bulletin. It describes various types of belts and tells how to select and match them. It lists seven steps for correct installation and offers as many hints for making them last longer. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 36 on postcard

Steel Buildings

An 8-page manual features a new panel method of construction. More than 5000 building sizes meet every space need, it says. Some of the buildings described and illustrated are: frameless, rigid frame, shed roof and utility. (Armco Drainage & Metal Products, Inc.)

For free copy circle No. 37 on postcard

Motive Power

How motive power helps you is told in an 8-page folder. It shows how a motive power survey helps customers buy correct industrial locomotives by following a typical team, step-by-step. The brochure lists sales offices offering this survey. (General Electric Co.)

For free copy circle No. 38 on postcard

Plant Location

Authoritative and helpful, a new booklet explains the benefits of locating in Pennsylvania. It explains plant location services. (Pennsylvania Dept. of Commerce).

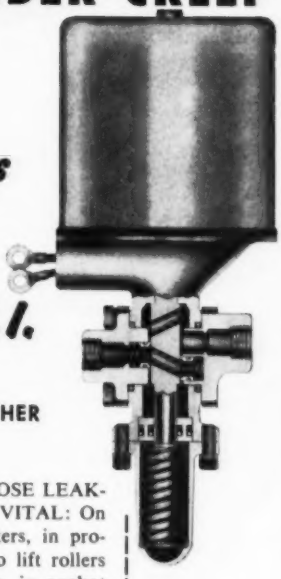
For free copy circle No. 60 on postcard

STOP CYLINDER CREEP

WITH 'SHEAR-SEAL' SOLENOID VALVES

LEAKPROOF AT 3000 P.S.I.

OIL & WATER, 1500 P.S.I. AIR OR OTHER INERT GAS



They are accepted wherever CLOSE LEAKAGE SPECIFICATIONS ARE VITAL: On hydraulic clamps of paper cutters, in propeller pitch control for ships, to lift rollers over seams in textile printing, in rocket charging, in nitrogen and freon charging (refrigeration coils, pressure bottle charging of insecticides and shave cream), as high pressure cut in on presses, on soaking pit doors and lift tables in steel mills, for airblast control on copper converters, on oil well blowout preventers, in test board applications, wherever a valve must be leakproof and stay leakproof.

NO STICKING

because the movement of the sealing members does not depend on lubrication, the direct acting solenoid maintains a positive power margin.

This is why we don't use SPOOL VALVE DESIGN, they depend on leakage for lubrication, dirt can enter spool clearances, cause binding and coil burnout.

LONG, MAINTENANCE-FREE SERVICE

is assured through the lapping action of the Shear-Seals against the slide, which actually improves the sealing qualities of the valve with each operation. The small amount lapped from the Shear-Seals after millions of cycles is compensated by a back-up spring. Dirt or pipe scale cause no damage or failure because the spring keeps the sealing surfaces in constant intimate contact.

This is why we don't use POPPET VALVE DESIGN; dirt in fluid passes over sealing surfaces, acts like a sand blast quickly destroying sealing qualities.

HIGH FLOW CAPACITY

apparent in the straight through flow, unobstructed by spools or poppets, often lets you go to a smaller Shear-Seal valve and still meet the flow requirements.

Write for Catalog 5-S

BARKSDALE VALVES

5125 Alcoa Avenue, Los Angeles 58, California

"SHEAR-SEAL" 4-WAY VALVES, 0 TO 250 P.S.I. AIR

$18.50 List Price*

*$18.50 is the list price for the ¼" port size and $19.50 for the ⅜" less usual quantity discounts.

NO MORE AIR VALVE TROUBLES FROM DIRT OR CORROSION

(AND WITHOUT COSTLY FILTERS AND OILERS)

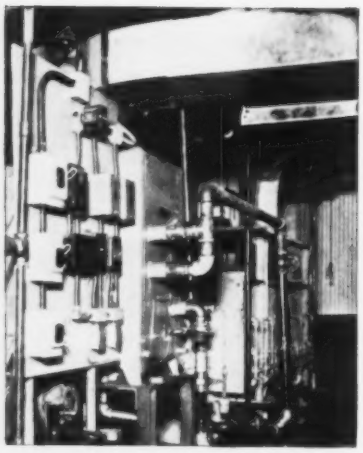
Important Savings	Low initial cost. Need no oilers and filters (time and materials savings).	All components are corrosion resistant.
Low Maintenance	Sealing qualities do not diminish with long, continued use.	Wear compensating "Shear-Seal" design.
Long Service Life	No production delays. Maintenance (rarely needed), without disturbing plumbing.	Lapped metal to metal sealing members.
Not Critical to Dirt	No scoring or binding. (As with spool or poppet designs.)	Flow is through "Shear-Seals." Sealing surfaces remain in constant intimate contact.
No Creeping Cylinders	Leakproof closure. (No internal port to port leakage.)	Maintained through lapping action of each operation.

Ask for bulletin A-5.

Foot operated models with or without spring return to reverse or to center are $24.50 list for the ¼" and $25.50 for the ⅜" valve less quantity discounts.

BARKSDALE VALVES

5125 Alcoa Avenue, Los Angeles 58, California



Improve Quenching and You Get Better Heat Treating

● The NIAGARA *Aero* HEAT EXCHANGER transfers the heat from the quench bath to atmospheric air. It never fails to remove the heat at the rate of input, giving you real control of the quench bath temperature. This prevents flashing of oil quenches. In all cases it improves physical properties, saves loss of your product from rejections and gives you faster production, increasing your heat treating capacity. You can put heat back into the quench bath to save the losses of a "warm-up" period.

Savings in piping, pumping and power as well as great savings in cooling water return the cost of the equipment to you in a short time. The Niagara *Aero* Heat Exchanger saves nearly all of the water consumed by conventional cooling methods.

For the complete story of other benefits and savings, write for Bulletins 120 and 132.

NIAGARA BLOWER COMPANY
Dept. IA-4, 405 Lexington Ave.
NEW YORK 17, N. Y.
District Engineers in Principal Cities of U. S. and Canada

You Arbitrate It!

JOSIE THE CLASS A ASSEMBLER

From the files of the American Arbitration Association

Josie K., a Class A assembler, was the most experienced worker in her department, where radio sets were put together. She was not only the best worker, but she liked to give her less experienced fellow workers a hand when they needed it.

So it was only natural, when the group leader in her section quit, for Josie to take over new responsibilities. She wasn't reclassified and paid the 10 cent differential that was coming to group leaders, but she did the work anyway.

After this had been going on for some time, Josie decided that she ought to get the classification and the pay that went with it, retroactive to the time the former group leader quit. But the company didn't see it that way.

"We never authorized you to be a group leader," the personnel manager said. "We decided when the group leader quit that we could get along without a replacement. The foreman can instruct new employees and manage the flow of work in that section without help. It's a management prerogative to decide whether we need a group leader and who it is to be."

"That's just a dodge to cheat me out of my increase," Josie answered. "I've got top seniority among the assemblers and you were glad to have me do the work of a group leader as long as I didn't demand the money for it."

The case went to arbitration, where the union asked for back pay for Josie and official reclassification to group leader for the future.
How would YOU rule?

The Arbitrator Ruled:

Josie got back pay from the time the old group leader quit to the time the grievance was filed. The arbitrator said he was convinced by the evidence that the foreman knew Josie was in fact doing the work of a group leader and that he was depending upon her to do so. On the other hand, the arbitrator held that under the management prerogative clause of the contract, management had the exclusive right to decide if a group leader was needed and to name, as group leader, an employee

Continued on facing page

NEW BOOKS

"The Mechanism of Phase Transformations in Metals" is a monograph containing a series of papers presented by the Metal Physics Committee in 1955. Papers deal with both nucleation - and - growth processes and martensitic transformations. There are 18 papers in all, including highlights in the work of Morris Cohen, F. Wever, T. B. Smith, Borelius and Larsson, and H. J. Goldschmidt. A worthwhile collection, it makes a handy reference for the researcher, 346 pp. $7.50 per copy. The Institute of Metals, 17 Belgrave Sq., London, S.W. 1, England.

"The Elements of Foundry Costing," is joint-authored by two well-known British cost and works accountants. Though concerned chiefly with English ironfounding, its authors show a good knowledge of American practices. It makes interesting reading. 79 pp. The Council of Ironfoundry Assns., 14 Pall Mall, London, S.W. 1, England.

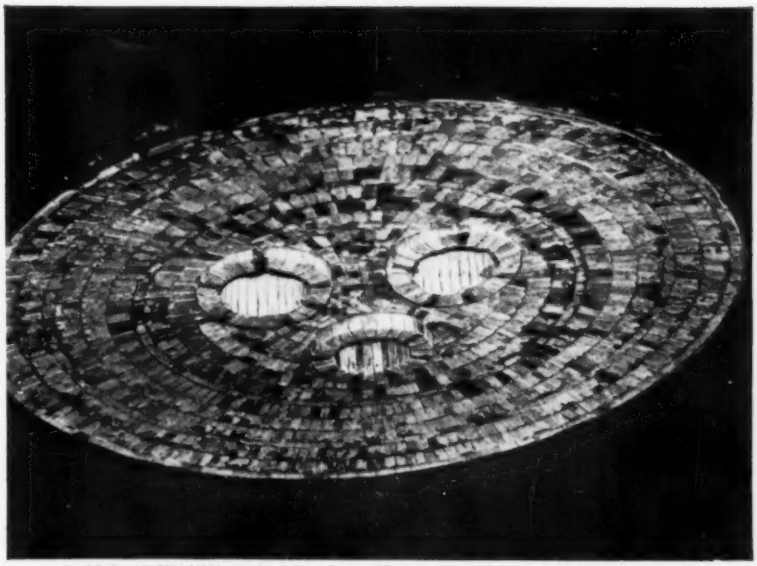
"Industrial Ovens and Dryers" can be safely installed and operated, as most installers and operators know. This book tells how and why. 40 pp. $1.00 per copy. Factory Mutual Engineering Div., Associated Factory Mutual Fire Insurance Cos., 1151 Boston - Providence Turnpike, Norwood, Mass.

The Arbitrator Ruled:

Continued

who did not necessarily have top seniority. Under the circumstances, the arbitrator ruled that if the company didn't want Josie to be group leader in the future they could appoint someone else or no one at all. But in that case, Josie should not be expected to do more than was required of any other assembler.

Caution: The award in this case is not an indication of how other arbitrators might rule in other apparently similar cases. Arbitrators do not follow precedents. Each case is decided on the basis of the particular history, contract, testimony and other facts involved.



An 18-ft. all-SHAMVA roof laid up for a 50-ton electric furnace melting alloy steels.

In electric furnace operations

SHAMVA MULLITE GIVES YOU OUTSTANDING SERVICE

"Shamva" Electric Furnace Roof Brick is a coarse and open type refractory, giving you the extreme spalling resistance necessary in top charge electric furnace roofs.

- *High fusion point (3335°F.)*
- *High softening point (over 3000°F.)*
- *Low coefficient of expansion (3.66 x 10^{-6} per °C.)*
- *Anti-spalling (0.7% at 3000°F. Preheat, A.S.T.M. test)*
- *High load bearing strength (—3.1%, at 3000°F., 1½ hrs., 25 p.s.i. A.S.T.M. test)*
- *Low heat conductivity for greater furnace efficiency*

With "Shamva" Mullite Brick, roof life and production increase, down time and labor costs decrease.

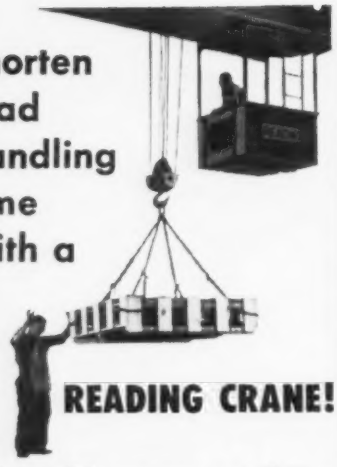
Let our field engineers assist in your refractory installation.

WRITE TO: *Mullite Works, Refractories Division, H. K. Porter Company, Inc., Shelton, Conn.*

Distributors in principal cities

HKP MULLITE WORKS REFRACTORIES DIVISION H. K. PORTER COMPANY, INC.

Shorten load handling time with a



READING CRANE!

● One well-known stove manufacturer wanted to speed-up assembly—a call to Reading Engineers led to complete solution. A 10-ton, double I-Beam, cab-controlled Reading Crane brought even better results than expected.

Get complete information from our latest 16-page bulletin "The Why and How of Faster Production". Write today.

READING CRANE & HOIST CORP.

CHAIN HOISTS • OVERHEAD TRAVELING CRANES • ELECTRIC HOISTS

2101 ADAMS ST., READING, PA.

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

CHATTANOOGA 2, TENN.

TECHNICAL BRIEFS

Selective Plating Gets Hard Areas

When plating parts by conventional means, sometimes it's unfavorable or impossible to plate certain areas. Yet, these need protection too.

Finishers solve this by selective plating these spots.

▪ Selective Plating solves a problem for an aircraft parts finisher. The setup plates large hollow steel propellor blade areas that are missed by the regular plating process.

The interesting technique involves finishing the area around a 3-in. hot-air deicing vent hole built into the tip of each blade. Because this hole must be plugged to prevent entrance of cyanide solution during the conventional plating bath, the area under the plug remains unplated.

To protect this area, Curtiss-Wright's Propeller Div. uses selective plating equipment. This brings the electrolyte to the part and passes current through it.

Plates Quickly — The original brush plating apparatus was built in the company's own shop, and the solutions made up as needed. However, they are now using commercially available plating equipment and electrolytes. The plating equipment provides the needed selection of current values to do the job efficiently. Also, the electrolytes do not harm the skin or give off noxious fumes. Plating is completed quickly.

In the current B-36 propeller renovation program, hundreds of propellers are being overhauled. They are completely dismantled, every part is inspected for wear and replaced, if necessary. Each blade is checked with great care to find signs of damage. If they pass this critical inspection, blades are reprocessed.

As part of the rejuvenation schedule, each blade is carefully cleaned, plated, rinsed then run through an anozinc process and rinsed again.

In a few seconds, signs of a zinc deposit become visible.

After the final rinse, dried compressed air is used to blow off any remaining moisture. At this point the job is finished, except for the small areas around the vent opening which are treated separately by the Dalic process. The equipment used for this is now supplied by Dalic

Want More Data?

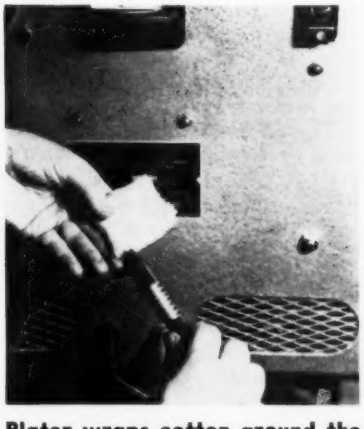
You may secure additional information on any item briefed in this section by using the reply card on page 133. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

Metachemical Ltd., Toronto, Ont.

How It Works — The cathode lead from the plating rectifier is clamped to the work. The stylus, which is part of the anode lead, is wrapped in cotton and dipped in the proper Dalic solution. Because they are non-toxic and non-evaporating, the solutions are kept in an open dish during use.

Several different types and sizes of stylus are available; the Propeller Division uses one of the smaller plug-types. With the current densities needed for their particular application, the stylus does not get excessively hot, and there is no danger of shock.

Cleans First — The plating department first uses a cleaning solution, passing the wet stylus back and forth over the area for about one minute. A cold water rinse

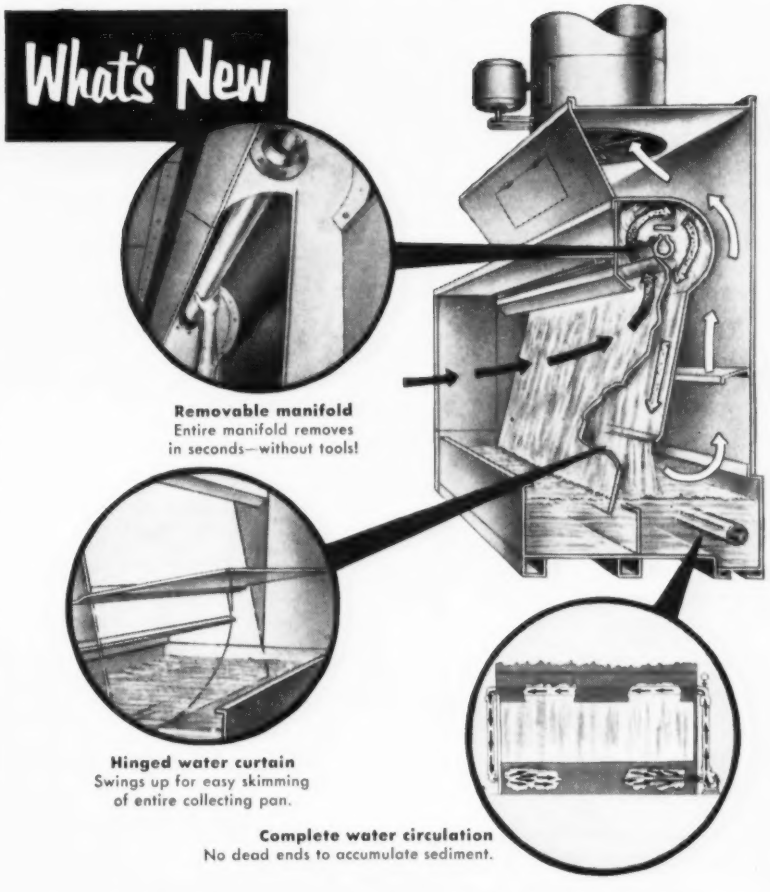


Plater wraps cotton around the unit's plug-type stylus.

follows. Then, similarly, another stylus is moistened with the zinc plating solution. This is once again rubbed over the area to be plated. In only a few seconds, signs of a zinc deposit become apparent. After approximately three minutes the desired thickness has been achieved. No special rinse is needed; cold water is enough.

Metallic Rectifiers

Installation of five new General Electric automatic metallic rectifiers promises a 30-pct rise in production


What's New
Removable manifold
Entire manifold removes in seconds—without tools!
Hinged water curtain
Swings up for easy skimming of entire collecting pan.
Complete water circulation
No dead ends to accumulate sediment.

Binks Style "E" Dynaprecipitor Water Wash Spray Booth

Built for easy maintenance
Manifold and front water curtain come out in seconds—without tools! Simplifies clean-up of manifold, upper wash chamber, rear water curtain and rear exhaust chamber. Hinged water curtain permits skimming of entire collecting pan without dismantling booth!

Built for low maintenance
Curved wash chamber surfaces prevent paint build-up. Complete water circulation system has no dead ends to accumulate sediment.

Needs less floor space
New design shortens depth of wash unit. Never before a booth with such maintenance ease.

Free descriptive bulletin
Ask your Binks jobber or industrial distributor for a copy of Bulletin DUE, or write direct to the address below.

Ask about our spray painting school
Open to all...NO TUITION...covers all phases

7050

Binks
EVERYTHING FOR SPRAY PAINTING

SPRAY GUNS

AIR COMPRESSORS

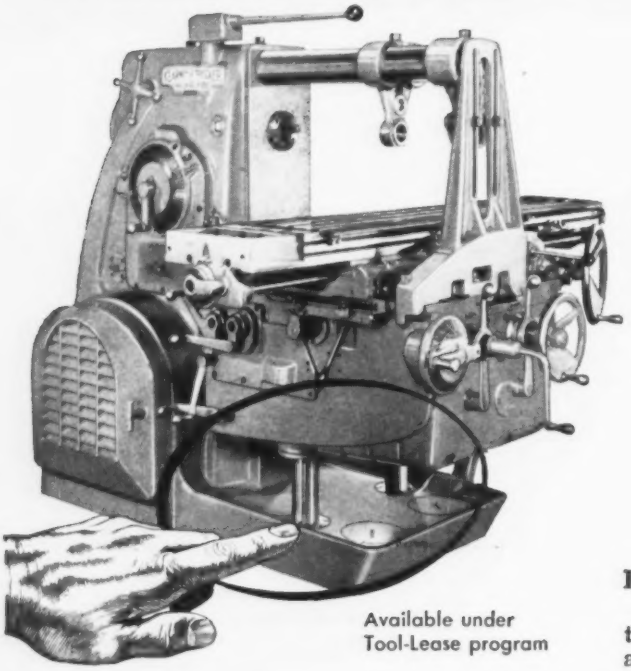
ACCESSORIES

Binks Manufacturing Company
3124-30 Carroll Ave. West, Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

COMMON SENSE says it's better...

Twin Screw Knee Support



Available under Tool-Lease program

Think it over... twin screw knee support is the one really new basic advancement in knee type milling machine design in years. And only Kearney & Trecker new TF Series machines have it!

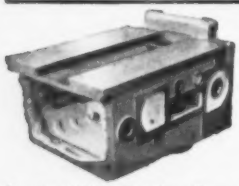
Here's why it makes sense.

Because the *twin screw* design distributes most effectively the weight of much larger, heavier knees, saddles and tables, it fulfills today's requirements for higher speeds, feeds and power — greater machine capacity. What's more, this *balanced design* substantially increases stability under heaviest loads... offers greater resistance to torsional thrust under all cuts... divides the wear factor in half, thus assuring greater, longer-lasting accuracy.

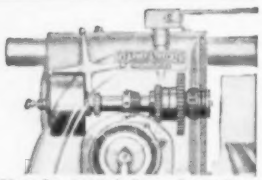
Kearney & Trecker's feature-packed TF Series line of general production machines is available in five sizes — No. 2 to No. 6, from 10hp to 50hp in Plain, Universal and Vertical styles.

Why take less than the latest when you want new milling machines? You can get all the facts on the new TF's from your Kearney & Trecker representative, or write direct to Kearney & Trecker Corp. Mail coupon for new catalog with details on TF Series machines.

5 more reasons why TF Series milling machines are way out front in rigidity

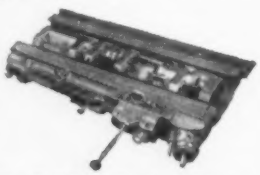


Heavier, Wider, One-Piece Knee — The TWIN SCREW arrangement supports the heavier, larger knee. Span and length of ways is increased considerably, providing fuller saddle support . . . lasting accuracy . . . substantial reduction of way and gib wear.



Three-Bearing Spindle — Complete assembly consists of three heavy-duty bearings, flywheel, a train of wide-faced forged steel gears. Rigidity of spindle unit contributes to increased cutter life, better finish and quieter operation.

Double "Vibra-Void" Overarms — Two solid steel bars, mounted completely through column, void vibration at source, afford more rigidity and resistance to deflection than any other type support. Design also greatly simplifies changing of arbors and cutters.



"Fron-Trol" Operating Convenience — Front-mounted controls include feed selection, Mono-Lever table feed and rapid traverse, automatic cycle table feed and rapid traverse controls, table handwheel, saddle clamping gib and backlash eliminator. Machines have 2" dia. table feed screw.

Massive Column — Solid back, double-box section column is scientifically ribbed throughout to rigidly withstand heaviest cutting forces. Full bearing column face affords maximum support for the knee. Cross-mounted motor assures maximum ventilation, easy access for routine maintenance.

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Williams & Wilson Ltd.

for a large Detroit plating company.

The Auto City Plating Co. will use the rectifiers and operator push button control stations to plate aircraft, marine, and diesel engine cylinders. It expects the new equipment to increase production through better control over dimensional tolerances and a marked decrease in operator's surveillance time.

Plates Cylinders — First use of the rectifier technique will be plating diesel locomotive engine cylinders. In the past when these were worn, over-sized piston rings were employed to repair the engines. With this new equipment, the inner dimension is plated with hard porous chromium. This eliminates the over-size piston rings.

The new GE rectifiers feature automatic control. This makes it unnecessary for an operator to check and regulate voltage changes continually. The automatic control is self-correcting. It helps eliminate human error and the need for constant surveillance. The control reduces the number of under and over-plated cylinders; the firm expects to regulate the thickness of the plating to within 0.0005-in.

Bore Cylinders—In the process worn cylinders are bored, oversize, then plated. Two electric hoists do the job. One hoist picks up the upper half of a self-designed electrical plating fixture; the other places the cylinder liner around the cylindrical portion of the fixture. The unit gets placed in the plating bath; then the required current is set and maintained with the aid of the self-regulating controls throughout the entire plating process.

Boosts Technicians

Industry faces a critical shortage of well-trained technicians right now. Between five and seven specialists are reportedly needed for every one professional engineer in all industrial areas. In one small attempt to solve this shortage problem, the National Assn. of Manufacturers has just come out with a 32-page educational aid booklet entitled, "Your Opportunities in Industry as a Technician." This aims its sights at young people still in school. It attempts to show youngsters the merits of becoming a technician.

Tells of Variety—Citing the wide range of activities and career opportunities in all fields, the pamphlet notes that the technician holds a key spot between the engineer and craftsman in industry, between theory and production. The booklet can be obtained from the NAM, 2 E. 48th St., New York 17.

Pigment Protects Iron, Steel From Corrosion

Good corrosion protection of iron and steel at relatively low cost is forthcoming from a new anticorrosive paint pigment. Seven years of testing indicate that paints containing the material give excellent protection to ferrous items.

The material makes use of a comparatively new concept developed in the research laboratories of National Lead Company, New York City. This is the idea that only the surface of an active pigment enters into the soap formation and reacts with the surrounding paint vehicle.

Researchers have been successful in making a pigment composed of particles each having a core of inactive silica encased in a tightly adherent film of active basic lead silicate. In essence, this new pigment makes extensive use of the favorable anti-corrosive and weathering properties of basic lead chromate. The latter's relatively high cost has discouraged its wide use as an anti-corrosive pigment, says the firm.

One Makes Ten—Due to its low specific gravity, 10-lb of pigment make a gallon of paint.

More than 1112 individual tests

Idea!

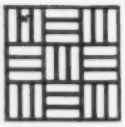
room air conditioning unit using H & K perforated metals

In the ¾ ton window air conditioner illustrated, perforated metals have been combined successfully with injection moulded plastics. The utilization, here, of new louvered perforated metals in adjustable frames on the frounced surface in combination with new embossed patterns on sides and under surfaces, afford rich tactile qualities hitherto unattainable in the air conditioner field.

Harrington & King perforated metals provide the Industrial Designer and other men of ideas unlimited opportunities to offer both functional and aesthetic properties as demanded in products for today's market. Contact H & K for your perforating requirements.

*Product Development by William M. Schmidt Associates

A few of the thousands of H & K perforated patterns. Illustrations are reduced in size.



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have been made with the pigment. Some have been on exposure for over seven years. Numerous paint vehicles under widely varying field test conditions indicate that this new chromate-type substance compares favorably with other anticorrosive pigments to effectively combat corrosion. Virtually all paint vehicles are compatible with this new pigment. The list includes: linseed oil, alkyds, acrylics, epoxys, phenolics, and vinyls. Others are under test.

Painter puts coat on steel angle irons at test station.

Paperwork Snarl Nils Automation Benefits

Sound paperwork procedures can have a greater impact on factory production than automation. So states R. A. Shiff, president of Naremco Services, Inc. of New York. The records management specialist aired his views recently to a conference of the American Management Assn. in Chicago. He points out that many production bottlenecks and weakened customer relations are due to the lack of "integrated paperwork programs."

He warns that the benefits of increasing mechanization can be lost or seriously impaired unless management adopts integrated programs. "The advantages of having a highly automated plant are offset when production specifications and schedules for delivery are buried in a welter of forms," he states. "Management needs more precise data with less paperwork if it wants to improve its control over production, keep its customers happy and maintain its competitive position."

"We may be standing on the threshhold of a new Golden Age of technology, but we can ill afford to become too enchanted with machines," Shiff declares. "There is still no substitute for the rational human intelligence."

Pellet Extrusions Add Strength

Stronger magnesium extrusions than were ever before available for military aircraft and missiles are being produced in volume with a unique new process known as pellet extrusion.

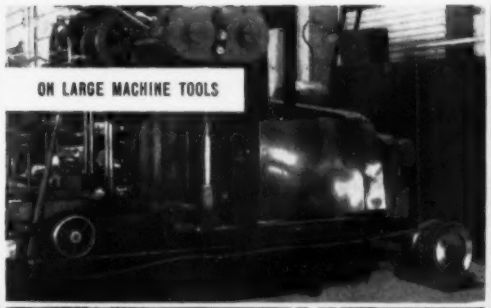
Dow Chemical Co. developed the method after several years' research in cooperation with the Air Force. The stronger sections are in production at Dow's Madison, Ill., rolling and extrusion mill.

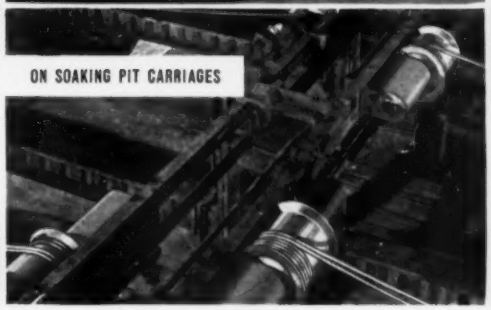
How It Works—In pellet extrusion, minute magnesium particles, rather than conventional solid billets, are fed into the extrusion press. Then the particles, or pellets, are forced through a die under heat and pressure, exactly as are the billets.

But the pellets are extruded into shapes with guaranteed compressive yield strength of 35,000 psi in cross-sectional areas up to 10 square inches. This is as much as 40 per cent higher than sections extruded conventionally.

Pellet extrusions owe their higher properties to the fact that magnesium's strength is inversely proportional to its grain size. And the pellets, which are spherical and about .016 in. diameter, can be extruded into sections with extremely fine grain size.

Takes Care—Success of the new process depends heavily on a foolproof method of making pellet material from molten magnesium alloy. Dow transforms molten mag-



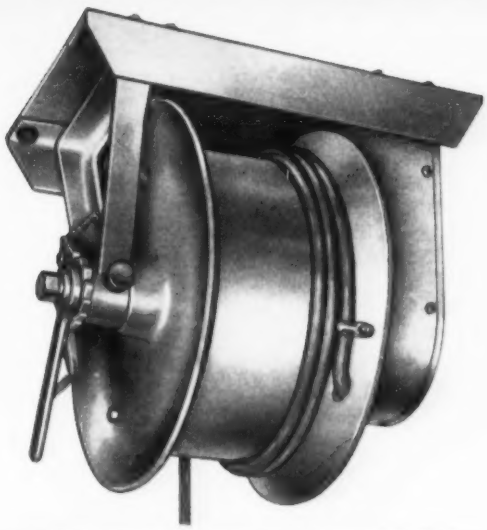


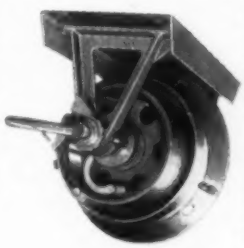
NO SPRING BREAKAGE...

IT'S A "*Shaw-Box*"® CABLE REEL

Spring breakage in a cable reel can create costly delays in handling and processing. Patented spring construction in the "Shaw-Box" Cable Reel eliminates spring breakage — assures performance you can bank on in the severest services. That is why so many magnet-equipped crawler cranes and overhead cranes have an automatic "Shaw-Box" Cable Reel to keep taut their flexible insulated conductor cables. Many more serve on soaking pit carriages and other machinery for the same reason.

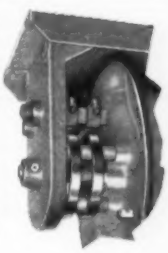
The "Shaw-Box" Cable Reel drum forms a water and grease tight compartment for the coil springs. Spring tension is easy to adjust *outside* the reel. Heavy-duty roller bearings assure smooth operation and minimize frictional wear. No complicated electrical maintenance. From every standpoint, "Shaw-Box" Cable Reels are tops in reliability and economy. They are available with 50 and 90 lbs. of pull and with cable capacities of 40, 60, 80, 100 and 120 feet. Get complete details. Write for Bulletin 368.





NO REVERSE BENDING of spring and consequent local crystalization. Spring breakage eliminated by patented design. Pull is constant. Ratchet lever simplifies spring tension adjustment to suit conditions.

MAINTENANCE IS EASY. Remove steel housing and entire heavy-duty collector ring, brush holder and brush assembly is exposed for inspection or servicing.



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give you { PROCESS FLEXIBILITY
PRODUCT UNIFORMITY
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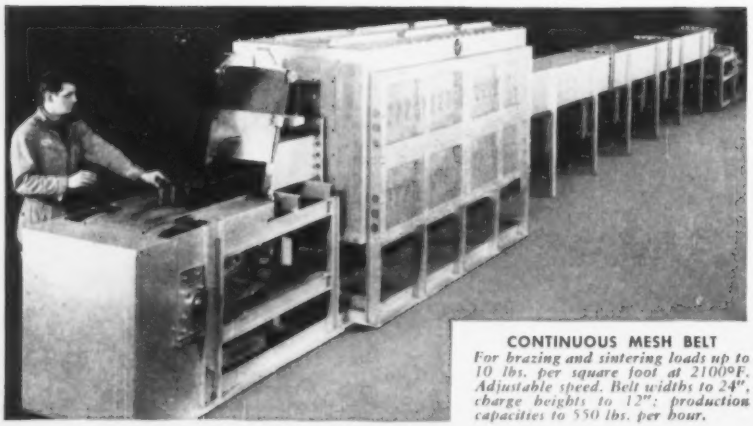

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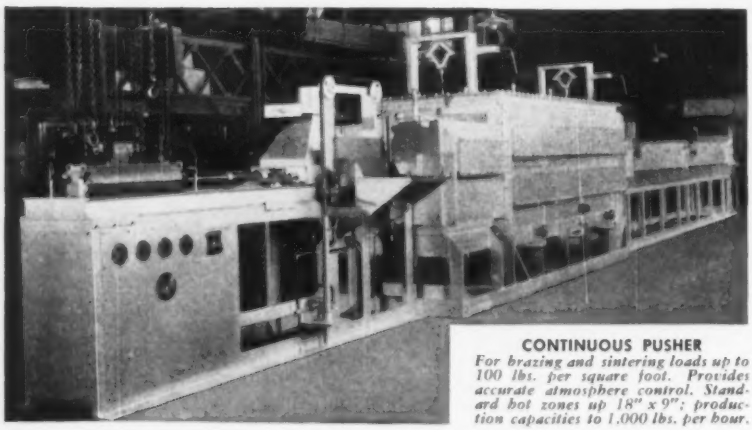
For brazing and sintering loads up to 10 lbs. per square foot at 2100°F. Adjustable speed. Belt widths to 24", charge heights to 12"; production capacities to 550 lbs. per hour.



CONTINUOUS PUSHER
For brazing and sintering loads up to 100 lbs. per square foot. Provides accurate atmosphere control. Standard hot zones up 18" x 9"; production capacities to 1,000 lbs. per hour.

If these are the three major qualities you want in a controlled atmosphere brazing or sintering furnace, you will find them in a Harper Electric Continuous Furnace. Process flexibility is the result of multiple zone heat control, variable speed drive, and properly applied control instrumentation.

Once the desired conditions have been established, you will obtain complete product uniformity. Conditions outside the furnace being equal, your brazed joints or sintered compacts will be identical hour after hour, week after week.

You will get up to 50% higher production from a Harper Electric Furnace with silicon carbide elements* than from comparable size furnaces using other elements. Another important advantage of these high-power elements is that they can be replaced in an emergency without complete shut-down.

Consider the brazing or sintering furnace designed for production. Write for further information today to Harper Electric Furnace Corp., 49 River Street, Buffalo 2, New York.

*Nickel chromium elements also available for lower temperature changes.

HARPER ELECTRIC FURNACES

For Continuous Brazing, Sintering, Wire Annealing, Bright Annealing, Annealing, Forging and Research

nesium alloy into pellets of uniform size within an atomizer tank.

Magnesium is first alloyed with small amounts of zinc and zirconium in a melting pot. Then the alloy is transferred to a holding pot, from which it flows onto a metal disk that spins at high speed atop a bearingless turbine within the atomizer tank.

When the metal strikes the disk, it is hurled off in globules onto the inner walls of the atomizer tank. In flight from disk to wall, the globules cool from about 1400°F

Press extrudes structural member from the pellets.

to about 300°F, assume a spherical shape, and a size of 0.007 to 0.023 in., depending on the speed of the disk and other variables.

Final Steps—As the pellets settle to the bottom of the tank, they cool further, then are piped through a screen which insures uniformity before packing.

In the extrusion process, pellets heat to about 650°F; are then piped into the extrusion chamber through a flexible tube.

Coat Ups Barrel Life

Lining sand-blast barrels with plastisol increases a firm's barrel life from four months to more than three years. At Underwood Corp's Hartford, Conn. plant, a barrel revolves around a sand blast nozzle;

You wouldn't cut out paper dolls with a hedge clipper!!

Then why shear 6-inch wide material with a 10-foot shear?

Cutting a small piece of light metal, plastic or rubber on a big shear is even more expensive than it is exasperating. Yet many shops, out of necessity, tie up big shears with small work.

That problem is solved by the New Lodge & Shipley 24″ Speed Shear. Specially designed for fast cutting of small pieces, it has a capacity of ⅛″ x 24″ mild steel. Its unique work table is provided with holes which allow fast set-up of guides, templates and protractors for production of straight-side blanks at speeds up to 120 strokes per minute.

A 24″ Speed Shear may easily pay for itself merely in freeing a big shear from wasteful small jobs. Investigate its possibilities in your plant. For detailed Bulletin No. PS-12, write: **The Lodge & Shipley Co., 3073 Colerain Ave., Cincinnati 25, Ohio**

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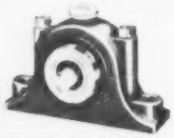

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DODGE
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TECHNICAL BRIEFS

the sand finishes small typewriter parts inside. Unlined barrels wore quickly under the blast and were relatively expensive to replace.

To reduce the cost of replacements and eliminate the inconvenience of changing barrels frequently, the company had all barrels spray-coated with a plastisol made by Metal & Thermit Corp. of New York. This coat is a 100-pct

Operator removes finished batch of parts from barrel unit.

solids polyvinyl chloride composition. It is abrasive and chemically resistant. The firm also uses a similar coating for coating racks and tanks in its plating department.

The plastisol lined barrels have stood up in constant use under the sand blast for three years. Since a barrel can be relined, it need not be replaced even after the lining wears out.

Sr_{90} Light Lasts Long

A small piece of Strontium-90, a specially-treated metal which is safe-sealed in a transparent plastic button, is the heart of a light just adopted by the Surgeon's Office, Hq., Air Materiel Command. It will glow in the dark for more than 5 years; will be used for illuminating entrance and escape hatch door handles on B-52 bombers.

It glows continuously. In the event of a night emergency where power failure is involved, the synthetic lightning bug would guide crewmen to escape hatches.

AEC Licensed—The AMC Surgeon's Office is now licensed to handle the self-illuminating button, by the Atomic Energy Commission. AMC is setting up testing and accountability procedures before distributing the light.

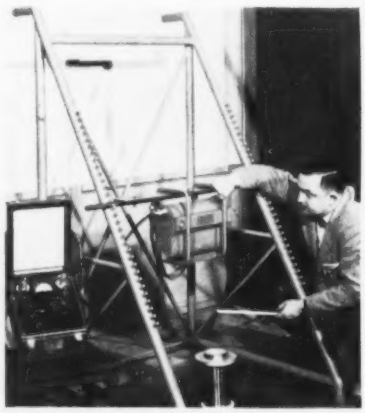
The Surgeon's Office at AMC is charged with the approval of handling of all radioactive sources that are requested or used by the Air Force from both a research or operational standpoint. Special weapons are not included.

The lights could also be adopted as wing-tip markers.

X-ray Tests, Inspects In Lab Or Field

A portable industrial X-ray setup weighing less than 75 lb, enables one company's inspectors to perform non-destructive quality control tests in the laboratory or field.

Used by the Research and Advanced Development Div. of Avco Mfg. Corp., Lawrence, Mass., the 140-kv unit operates at 110 to

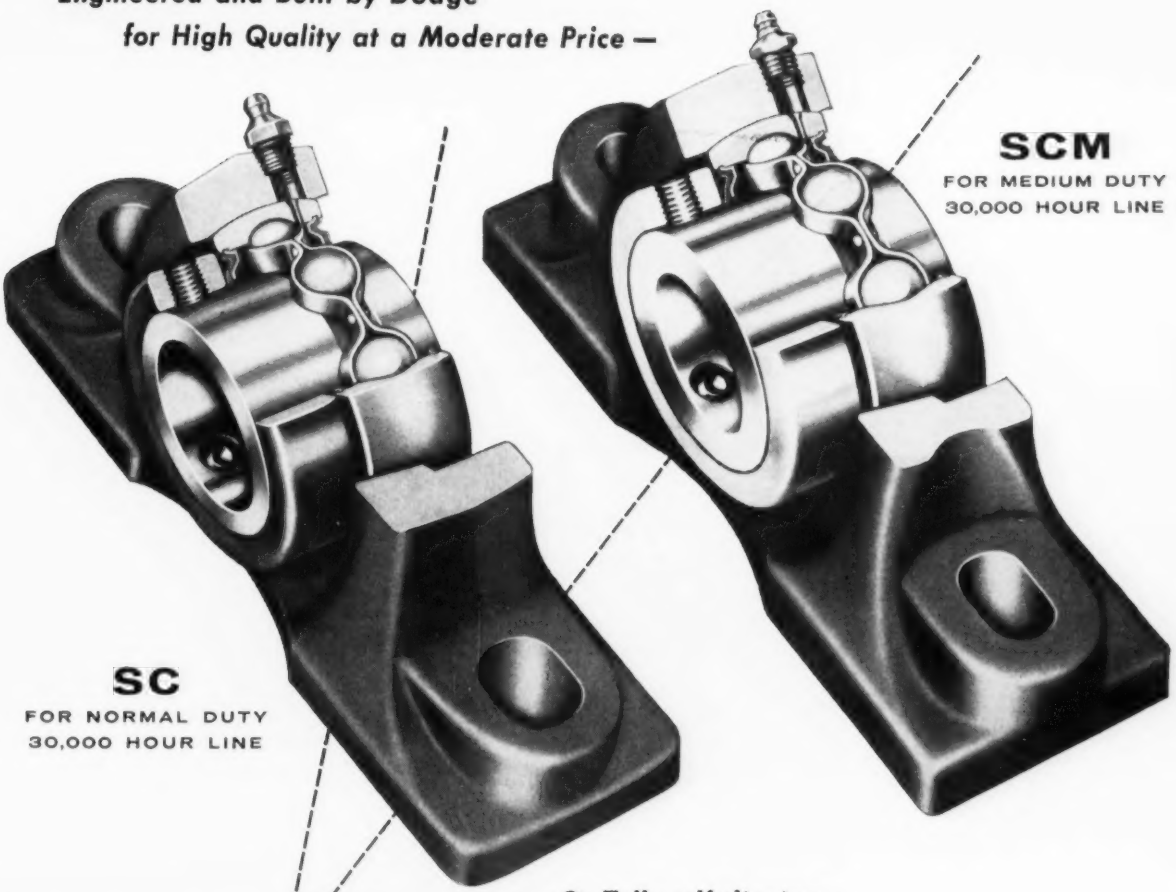


This portable X-ray setup weighs less than 75-lb.

220-v. It can be mounted on a rack or slung over the operator's shoulder for mobility in field inspection. The set is manufactured by Balteau Electric Corp., Stamford, Conn.

Avco inspectors state a high de-

Engineered and Built by Dodge
for High Quality at a Moderate Price —



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30,000 HOUR LINE

SC
FOR NORMAL DUTY
30,000 HOUR LINE

The Seal *Won't Blow!*

- Fully self-aligning.
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- Fully assembled and pre-lubricated at the factory.
- Sealed both on and off the shaft.
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- Pillow block and flange cartridge types.
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- Write for bulletin complete with tabular data, engineering drawings, dimensions, weights, and radial load ratings.

Call the Transmissioneer, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

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of Mishawaka, Ind.

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TO THIS IN YOUR PLANT THE SAME DAY:

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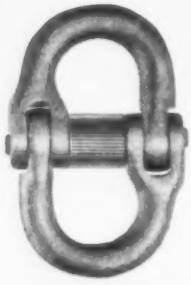
Gone are the days of waiting for new or rebuilt sling chains to reach you from the factory. Now, with all components furnished by your Herc-Alloy distributor, you can have your slings the same day. Leading alloy chain users are doing it. Write us or call your CM Chain Distributor for catalog, prices and assembly chart.

HOW IT'S DONE!

With ***Hammerlok*** Coupling Links, anyone who can drive a nail can assemble or rebuild a sling chain in minutes. No peening! No welding! ***Hammerlok*** is rugged ...reusable...safe. Endorsed by leading alloy chain users.



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HERC-ALLOY® HAMMERLOK®

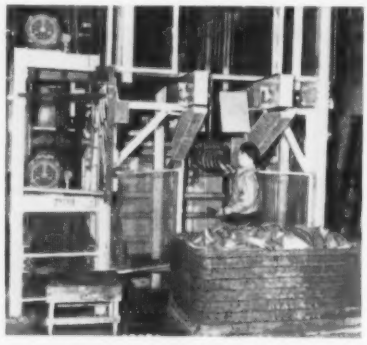
gree of efficiency is achieved with the setup in inspection of: (1) steel or copper fabrications up to 1¼-in. thick, (2) 3-in. thick aluminum, and (3) 4½-in. thick magnesium.

Also Tests Welds—Non-destructive testing is also conducted on welds, castings or forgings. Avco quality control checks for porosity, non-metallic inclusions, discontinuities and bursts.

The unit consists of a 46-lb head and 29-lb control case. Lead screens shield inspection personnel from the unit during X-ray testing. The quality control department also hopes to construct a trailer unit for field tests and on-the-spot development of X-ray films.

Salt Bath Austempers With No Distortion

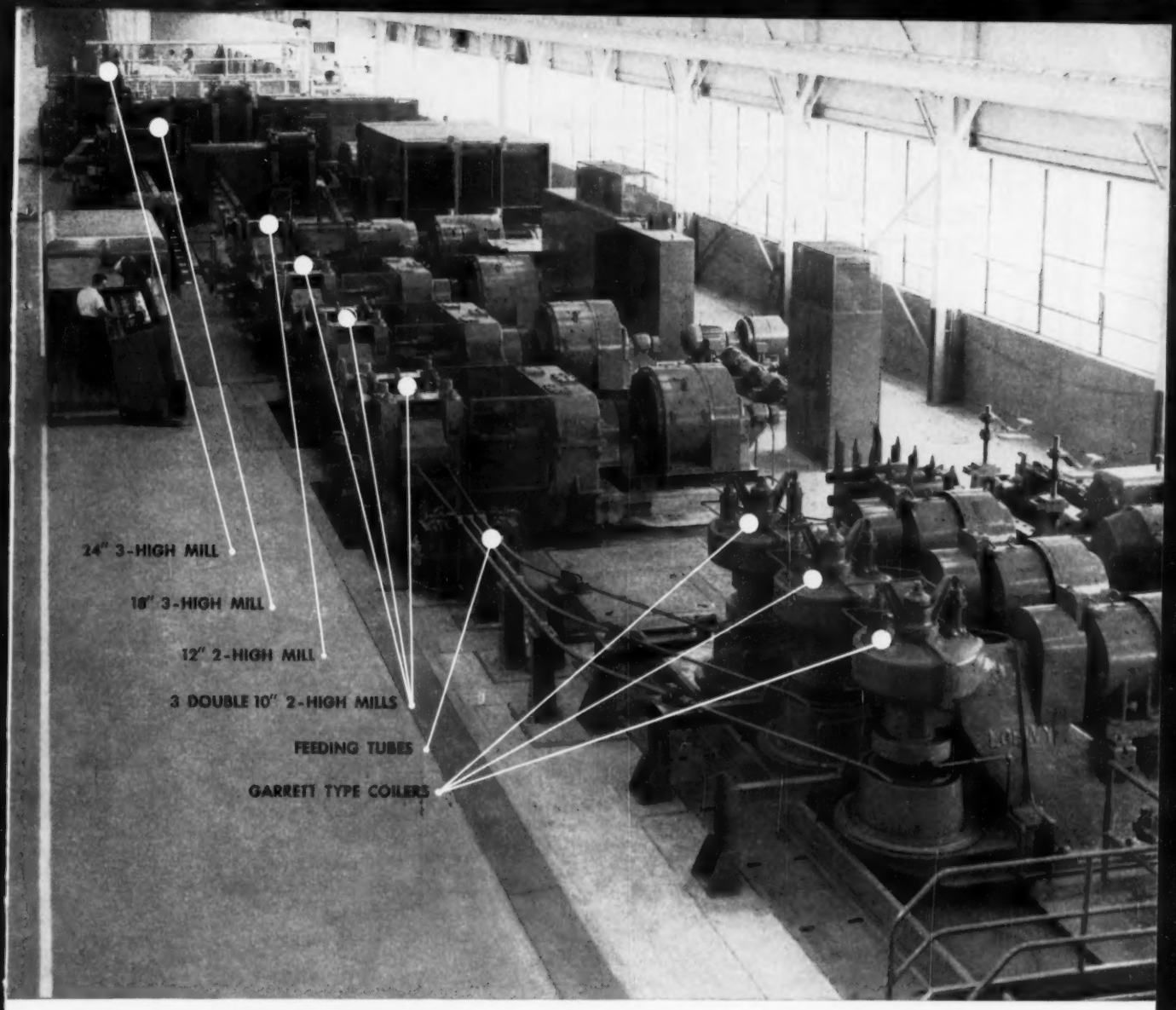
The Empire Plow Co., Cleveland, heat treats farm tools using a one-man mechanized electric salt bath line. The installation, built by



Worker hangs parts for austempering on automatic conveyor.

Ajax Electric Co. of Philadelphia, austempers parts to Re 37/44 without distortion.

The line consists of an austenitizing bath operating at 1600°F, a quench at 400°F, a tempering furnace held at 750°F, and a water wash and rinse tank. A horizontal chain conveyor moves work through the line. Individual vertical conveyors make transfers between operation.



This installation has a capacity of 40,000 lbs per hour for 2-strand rolling with finished coil delivery every 19 seconds.

new Loewy copper wire rod mill reduces wire bars to 5/16" wire rod, automatically

At the plant of a leading manufacturer of electric cable, this new Loewy mill is rolling 5/16" and 7/16" copper wire rod from standard wire bars in a continuous, fully automatic operation.

The mill consists of two 3-high roughing mill stands, seven continuous finishing stands and three Garrett coilers. Copper wire bars are conveyor-fed into the furnace. After leaving the furnace the ingots are rolled down in 14 passes to finished size. Leaving the last stand at a speed of 2400 FPM the wire is coiled. The coils are tied and conveyed into a pickling line. The entire procedure is automatic and all operations are controlled from one operator pulpit.

Like this high-speed wire rod mill, all Loewy equipment is designed to produce more, in less time, at lowest cost. We design, build and install blooming and slabbing mills, plate mills, structural and rail mills, bar and skelp mills, continuous billet and strip mills for ferrous and non-ferrous metals as well as high-speed foil mills. For illustrated bulletin 14002, write Dept. 446, Loewy-Hydropress Division, BLH Corporation, 111 Fifth Avenue, New York 3, N.Y.

BALDWIN BLH LIMA-HAMILTON

LOEWY-HYDROPRESS
BALDWIN-LIMA-HAMILTON

DIVISIONS: Austin-Western • Eddystone • Hamilton • Electronics & Instrumentation • Lima • Madsen • Loewy-Hydropress • Pelton • Standard Steel Works

CM Lodestar®

FEATURING:

- Push Button Control
- Ultra-Modern Regenerative Electric Braking
- Self-Adjusting Heavy Duty Magnetic Brake
- Sealed-in Lifetime Lubrication
- Overload Protection
- Fully Enclosed Components
- Lowest Headroom
- "CM-Alloy" Flexible Link Chain

CAPACITIES: from ¼ to 1 ton. Single and 3 phase. ¼ ton model weighs only 51 pounds.

$149.50 and up
F.O.B. Factory

Built to serve you without costly maintenance

Lodestar is the first truly "heavy duty" version of the small electric hoist. The CM Lodestar is designed to operate without costly maintenance or interruptions in your work schedules. The initial cost is practically your only cost with a Lodestar... an extremely low cost indeed!

WRITE US or call your CM distributor for literature, prices and quick delivery from stock.

CHISHOLM-MOORE HOIST DIVISION
Columbus McKinnon Chain Corporation
Tonawanda, New York
REGIONAL OFFICES: NEW YORK • CHICAGO • CLEVELAND
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

CM HOISTS AND CHAIN

Wooden Dummy Speeds Cutter Development

Wooden dummies of milling cutters aren't much good in working stainless steel. However, here's an unusual case where they paid off in design and development.

When Goddard & Goddard Co., Detroit milling cutter manufacturer, was awarded a contract for special cutters for milling stainless steel turbine blades, their engineers were determined to obtain the finest possible cutter performance. So, they built wooden dummy models

This wooden mockup helped designers make new milling cutters.

of each cutter to determine: (1) Best possible blade arrangement alignment (2) Best and most economical way to manufacture, and (3) Most economical design to maintain and sharpen.

Use Chip Breakers — Cutters were made with chip breakers and staggered tooth design to ease the load on the machines. They proved so successful that their potential machining capabilities were far beyond the capacities of the machines themselves.

Builds Big Press

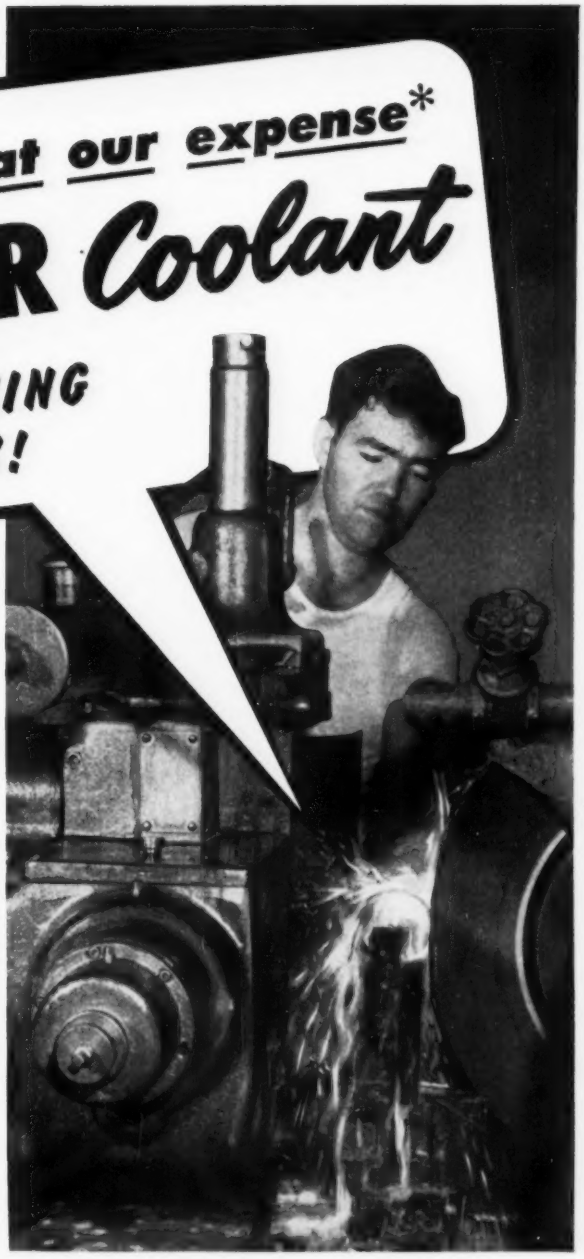
With the machining of three very large castings, a team of Canadian firms has completed another step in the production of a 160,000-ton press. The press is a three-unit hydraulic O-ing setup for

See For Yourself at our expense*

HAMIKLEER Coolant

(REG. U.S. PAT. OFF.)

CUTS METALWORKING COSTS 6 WAYS!



Here's how HAMIKLEER—the odorless, synthetic coolant and rust preventive—can cut your metalworking costs 6 ways:

1. By eliminating the need for and cost of many different coolants. HAMIKLEER can be used for practically any cutting, grinding or aqueous phase operation on cast iron, hard and soft steels.

2. By reducing rejects—speeding production. HAMIKLEER always keeps work cool, clean and visible, allowing finer surface finishes in shorter time.

3. By preventing rust—even in hot, humid weather—eliminating costly cleaning operations. HAMIKLEER is a rust preventive as well as a coolant and it will not turn rancid.

4. By increasing tool life to make fewer replacements. HAMIKLEER has excellent lubricity and anti-weld properties.

5. By lasting longer. The amount of HAMIKLEER consumed or "carried away" is held to an economical minimum by the thin body of the solution.

6. By eliminating costly disposal problems. HAMIKLEER can be run down drains without gumming or clogging, providing oils don't get into the mixture.

A large metalworking firm standardized on HAMIKLEER after testing 30 different brands of coolants. HAMIKLEER was the only coolant that proved overall superiority ... improving lubrication, cooling, rust prevention, better finish, longer tool life and wheel life.

SEND FOR FREE SAMPLE . . . *to test on your own metalworking operations.

HARRY MILLER CORP. HAMICO 4TH & BRISTOL STREETS PHILADELPHIA 40, PA.

Manufacturers of
HAMIKLEER, ACTIVOL, HAMICOTE,
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HARRY MILLER CORP.

Original Products and Processes Since 1936

4th and BRISTOL STS., PHILA. 40, PA.

DAvenport 4-4000 *Service Representatives in Principal Cities*

WHY TRY TO SOLVE YOUR GEAR PROBLEMS ALONE?

PERKINS can custom-cut a precision gear to fit your exact needs...make you a gear that guarantees full capacity and trouble-free performance. Many gear-makers promise a precision gear — Perkins delivers precision . . . always. Fifty-two years of gear-making for aircraft, automotive and instrument manufacturers assure top quality. Extensive facilities, modern equipment, rigid production and quality controls produce gears consistently uniform in tolerance with a burr-free micro finish. Perkins quality eliminates production delays and costly rejects for you . . . Perkins gears wear longer, cost you less in the long run. Ask us to quote on your next gear requirement. Then judge for yourself.

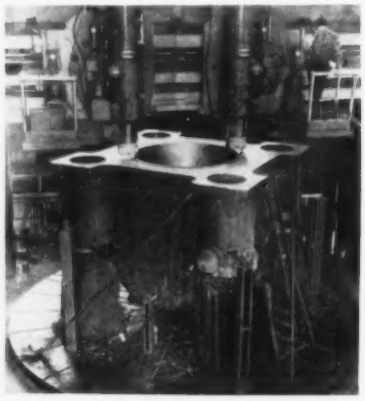
YOURS ON REQUEST Folder showing custom gears Perkins has made (from various materials) for aircraft, automotive, precision instruments, home appliances, portable and machine tools, and other products. Includes Perkins facilities for producing various gear types and sizes. *Write today.*

PERKINS
MACHINE AND GEAR CO.

Dept. 31, West Springfield, Mass.
Telephone: REpublic 7-4751

forming 20 to 36-in. diam welded steel pipe in gages to ½-in.

Each of the press' three cylinders weighs nearly 150,000 lbs. Metal thickness varies between 11½ and 22 in. Walls of the cylinders will



This is one of three large castings going into the press.

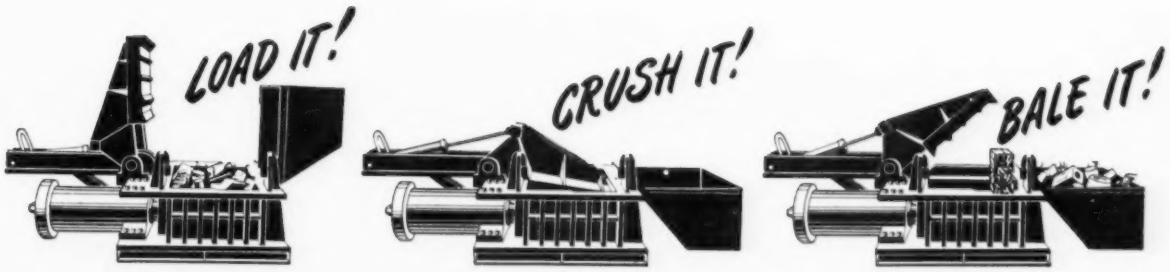
accommodate pressures in excess of 3000 psi. It is designed to produce thirty 40-ft long pipes per hour.

Three Canadian heavy equipment firms are participating in building this press. Canadian Steel Foundries produced the castings, Canadian Allis-Chalmers handled the precision machining, and Montreal Locomotive Works constructed the press for Welland Tubes Ltd. Welland, Ont. The press was designed by the Verson Allsteel Press Co., Chicago.

Cuts Tool Costs

Selection of the correct carbide cutting tool and tool tip material pays off well for American Pulley Co., Philadelphia. In turning out small countershaft pinions, the firm cuts tool costs approximately one-seventh using throw-away type insert tools.

The company turns the pinions out of a bar of SAE 4140 chromemoly steel of 212 Brinell hardness. The producers turn the various diameters on both ends of the work piece at 0.0138-in. feed, ¼-in.



We Build the Dempster-Balester to Load It, Crush It, Bale It— Bale After Bale After Bale

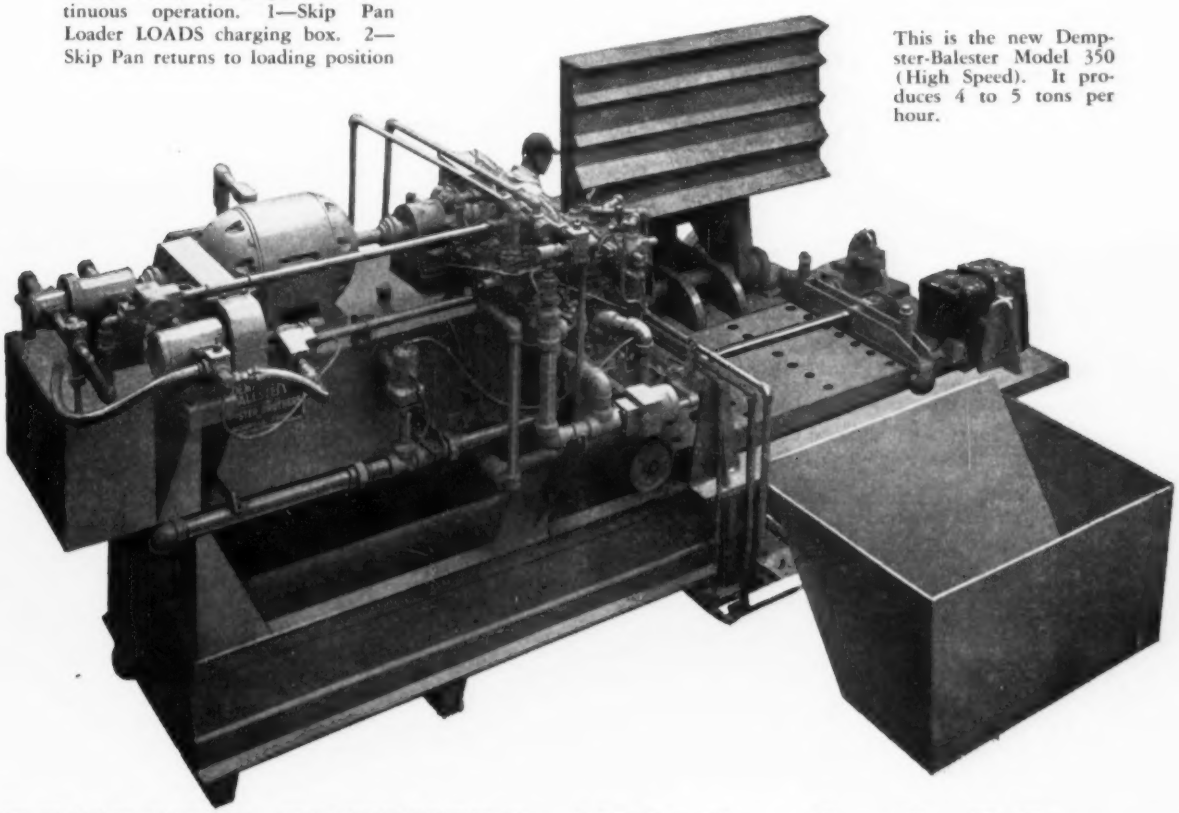
You not only get the nearest thing available to automatic baling when you buy a Dempster-Balester, but you get a press built to take the punishment of scrap metal baling consistently day-in and day-out . . . bale-after-bale-after-bale! The first Dempster-Balester was built in 1940 and it is still in operation. Today, hundreds of Dempster-Balesters are making money for men like yourself in over 200 cities in almost every state of the union, plus 15 foreign countries.

The Dempster-Balester's LOAD IT, CRUSH IT, BALE IT cycle (illustrated above) is a simple 1-2-3 continuous operation. 1—Skip Pan Loader LOADS charging box. 2—Skip Pan returns to loading position and Auxiliary Compression Door CRUSHES scrap with a 45-ton force. 3—As Compression Door returns to up-right position, charging box door closes . . . scrap is BALED and ejected. As each cycle ends another begins.

Without question, Dempster-Balesters are the fastest, most efficient presses baling scrap metal today! And you have six to choose from—three standard and three high speed models that turn out high density bales in capacities to meet any requirement from 1 to 9 tons per hour.

And don't overlook this important point. Before buying a baling press, it's important to know what kind of service you can expect. Certainly, no piece of heavy machinery can operate consistently without maintenance. Breakdowns cost money and when a part is needed for one of our presses, it is usually shipped the day your order is received. An ample stock of repair parts is constantly maintained to take care of you promptly! Write to us today for complete information.

A product of Dempster Brothers, Inc.

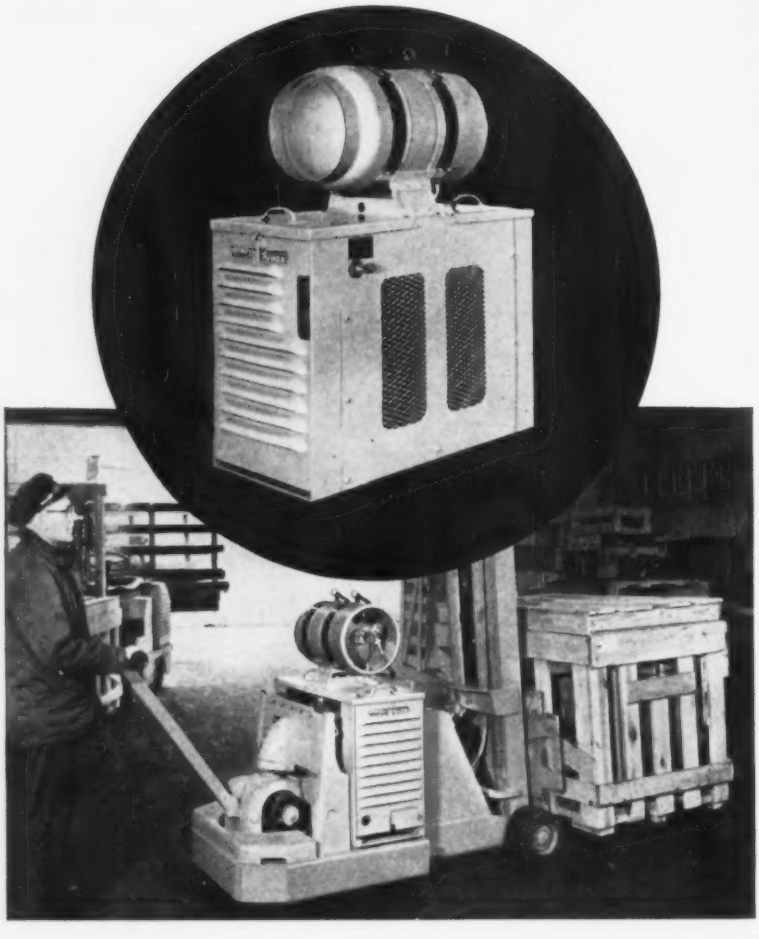


This is the new Dempster-Balester Model 350 (High Speed). It produces 4 to 5 tons per hour.

DEMPSTER BROTHERS, 447 N. Knox, Knoxville 17, Tennessee

LPG-ELECTRIC

The Versatile READY-POWER way!



New! Bantam Model W12 for Electric Powerized Hand Trucks

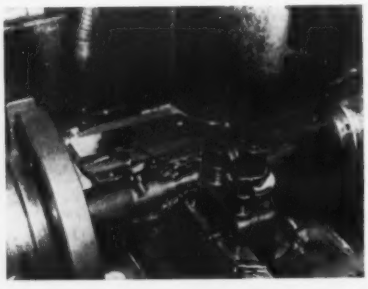
Ready-Power combines full electric power *with no fatigue* AND the economy and low maintenance of LP-gas in one compact new power unit. Installation is quick and easy on any make of electric hand truck with adequate sized power compartment. Bantam model W12 accommodates an interchangeable 20-pound fuel cylinder, includes a quick-disconnect fuel line coupling for safety, has removable end plates and hinged cover plate for easy accessibility. LP-gas components are listed by Underwriters' Laboratories and comply with Factory Mutual recommendations. It's easy to convert your present trucks to this modern, full-production power. Specify "Ready-Power" when ordering new trucks. Write for information.

READY-POWER

The READY-POWER Co., 3822 GRAND RIVER AVE., DETROIT 8, MICH.

Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units; Gas and Diesel-Electic Power Units for Industrial Trucks

maximum depth of cut. It's done at 720 rpm and 303 max. sfpm. Three cuts are required on each end.



Here, a throw-away tool works a small countershaft pinion.

The job uses Kennametal's standard positive rake tool with Grade K21 triangular insert. Turning was done on a Monarch air tracer lathe of 25 hp.

Electroluminescent Lamps Use Metal

Metal is replacing glass in electroluminescent lamps made by Sylvania Electric Products, Inc., of New York City. Instead of an all-glass construction for the panel type lamps, the firm now uses enameling

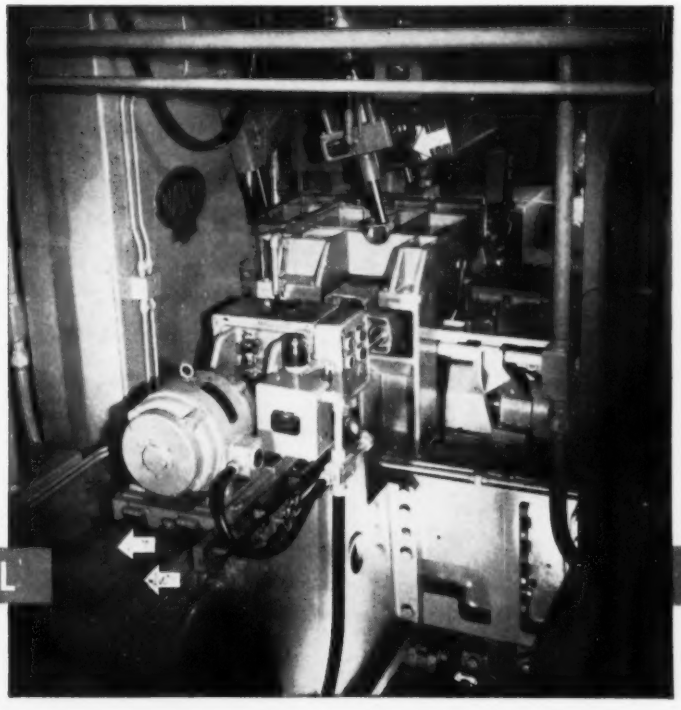
Finisher sprays special coat on the light panels.

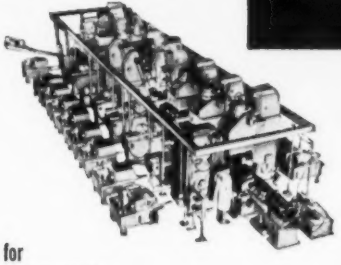
steel, coated with a ceramic-and-phosphor mixture, a tin salt solution and a transparent conducting surface of a tin compound.

"The fragile and heavy all-glass electroluminescent lamp is obsolete

50 Auto Blocks An Hour!

WITH THE HELP OF Allegheny Ludlum SARATOGA TOOL STEEL





Allegheny Ludlum Saratoga was used for the steel ways (note arrows, above) of this giant unit, illustrated at left in a bird's-eye view reduced to miniature size.

Write for BLUE SHEET ON SARATOGA

This concise four-page folder gives all needed handling and shop treatment details on Saratoga. Included is certified laboratory information on physical characteristics, and complete data on forging, annealing, hardening, tempering, etc. *Ask for your copy.*

ADDRESS DEPT. A-88

98 SEPARATE OPERATIONS are carried on by this versatile machine which turns out 50 V8 auto engine blocks an hour. It consists of 18 machining units, each of which is fitted with hardened and ground steel ways of A-L Saratoga to guarantee accuracy in production.

MILLING, TREPANNING, DRILLING, counterboring, reaming, chamfering, automatic inspection of holes for depth and removal of chips are the operations performed by this amazing mechanism.

SARATOGA WAS USED BECAUSE its extreme hardness, high resistance to wear, and excellent machinability more than met the customer's high requirements for maintaining accuracy in this huge, multi-station machine.

ALLEGHENY LUDLUM METALLURGICAL SERVICE can solve *your* tool or die steel problems. ● Call your local A-L representative or distributor, or write *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pennsylvania.*

For nearest representative, consult Yellow Section of your telephone book.

For complete **MODERN** Tooling, call

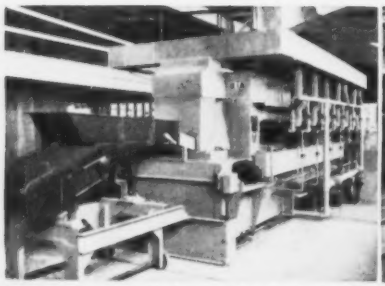
Allegheny Ludlum

WSW 6385

AL FINE TOOL STEELS SINCE 1854

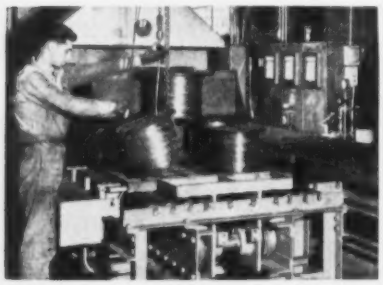
EF FURNACES

Built to meet your specific requirements

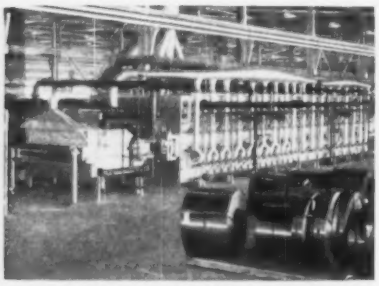


EF gas fired radiant tube combination hardening and dry cyaniding furnace with automatic feeder that distributes parts evenly on conveyor; and a dual oil, water quench.

Tubing, strip, rod and wire in coils, strands or on reels are being uniformly processed in hundreds of EF continuous and batch type furnace installations.



Charging end of EF special atmosphere bulkhead pusher furnace; bright anneals copper and copperweld wire and clean anneals brass wire. Capacity 4000 lbs. per hour.



EF gas fired unit—bright anneals wide or narrow strip in single or multiple strands. Other continuous and batch types for ferrous or non-ferrous, including stainless

Reflecting more than 40 years of continuous research and experience, and thousands of successful gas fired, oil fired and electric installations, EF engineers are in position to design, build and install the exact size and type of equipment you need for any product, any hourly output and any heat treating or heat processing requirement. Furnished complete with special atmosphere equipment and material handling facilities, synchronized and coordinated with your production schedules.

To assure high heating efficiency, low maintenance, high hourly outputs and uniformity of finished product, take advantage of the wide experience and complete service offered by EF's experienced heat processing engineers—You'll find it pays.

BULLETIN No. 461
shows typical installations of EF Gas-fired, Oil-fired and Electric Furnaces.
Send for a copy today!

THE ELECTRIC FURNACE CO.
GAS FIRED, OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION
Salem - Ohio
Canadian Associates • CANEFCO, LIMITED • Toronto 1, Canada

for most purposes," the company contends.

Stamped From Sheet—The lamps now come from 0.025-in. thick sheet. These are stamped or cut into practically any desired shapes with as many holes or slots as needed. The sheet is then processed by coatings and firings.

The lamps operate only on alternating current. Their brightness depends on the voltage and frequency of the electrical field applied across the dielectric phosphor layer. They bear practically no physical similarity to any other light source, having no filament, bulb, vacuum, gas discharge or tube.

Spray Lube Setup Cuts Extrusion Costs

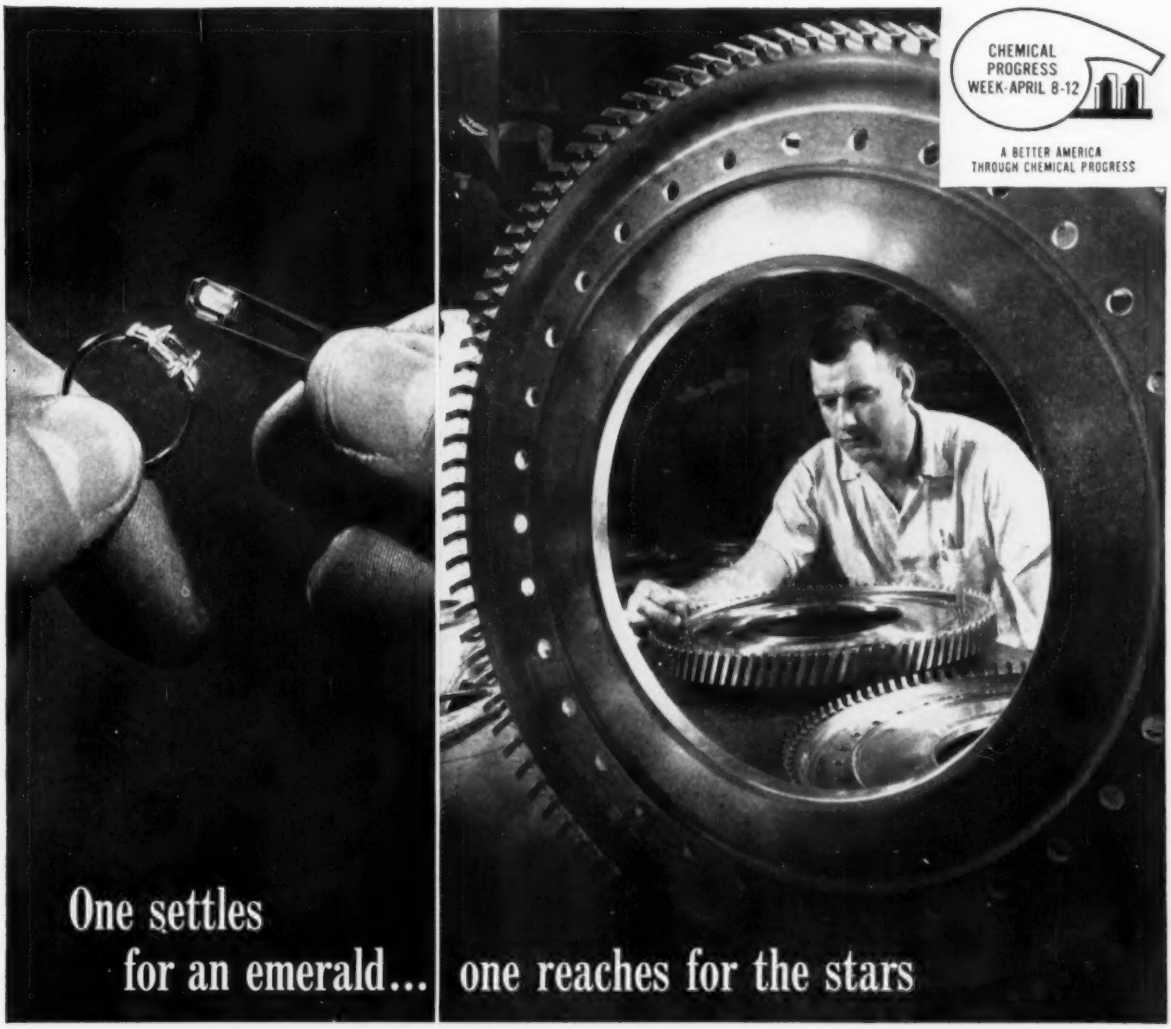
Manufacturers engaged in extruding light metals, particularly aluminum, sometimes can achieve substantial savings by using the spray method of die lubrication.

According to The DeVilbiss Co., Toledo, Ohio, installations now in use show the following advantages:

No Dripping — The lubricant, which usually contains a caustic to dissolve particles adhering to the die, is in a sealed container. This eliminates dripping, spilling, splashing and contamination. It provides considerable safety for the operator.

Atomization of the material and the velocity provided by the spray system forces the lubricant deep into the die. This insures coating all vital surfaces.

Another Safety Factor—Use of an extension on the spray gun lets the operator lubricate the die without placing any part of his body in the machine. In addition, the spray system is usually faster than hand lubricating. Proper use of spray equipment sometimes results in material savings up to 50 pct. Rejects of extruded parts, due to scratching and scoring, are often reduced as much as 30 to 50 pct.



both are vapor degreased in Columbia-Southern Trichlorethylene

This 2¼ pwt. gold ring setting and these J-57 jet engine turbine assemblies of steel could hardly differ more. But there's a common denominator: vapor degreasing in Columbia-Southern Trichlorethylene prior to finishing. Like bathing a bird-of-paradise and a tiger in the same tub? Well, the "bath" proves just right for each.

A product of original design and development—from pilot plant to *neutral* stabilizer—Columbia-Southern's Trichlorethylene is winning preference as the ideal vapor degreasing solvent for fast, efficient, low-cost cleaning of metal parts and assemblies. Huge plates and forms, tiny tubing and springs, finely machined surfaces and rougher, porous castings . . . all drain clean of contaminants in seconds. Painting and plating departments average far fewer rejects traced to incomplete cleaning.

This versatile solvent is made to extremely rigid standards of controlled quality by Columbia-Southern, one of the world's leading merchant producers of chlorine . . . an added assurance of dependable supply, incidentally. Its non-flammability, high vapor density and low boiling point mean added operating safety and purchasing economy. And the exclusive, *neutral* stability built into Columbia-Southern Trichlorethylene gives it chemical protection against decomposition under light, heat, oxygen, acids, moisture, and repeated distillations. It works equally well in batch and continuous units; on vapor, vapor slush, immersion, or vapor-spray-vapor cycles. Quenching oils remove as easily as light lubricants, even from deep draws.

Tank cars, tank trucks, drums . . . Columbia-Southern Trichlorethylene is available in the quantity most advantageous for your use. Get more information from your nearest Columbia-Southern sales office or your solvents distributor.

COLUMBIA-SOUTHERN CHEMICAL CORPORATION
SUBSIDIARY OF PITTSBURGH PLATE GLASS COMPANY
ONE GATEWAY CENTER · PITTSBURGH 22 · PENNSYLVANIA

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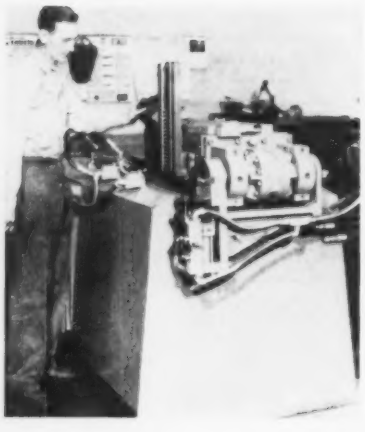
IN CANADA: Standard Chemical Limited
and its Commercial Chemicals Division

New Production Ideas

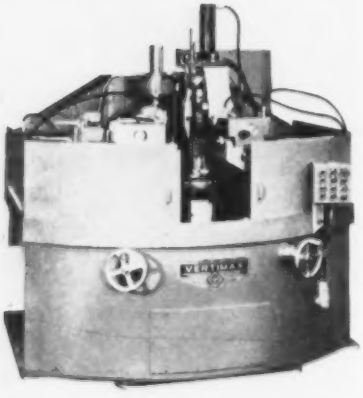
Equipment, Methods and Services



Tube Bender Uses Reciprocating Torque Actuator

Powered by a torque actuator, a tube bending machine produces over 1500 automobile radiator parts per hour. The automatic machine cycles continuously to bend a 2-in. length of ⅜-in. OD thin-wall copper tubing 180° without defroming the tube diameter. Conveyed from a rotary feed unit to a vertical magazine, the pieces gravity-feed to a cylinder. This thrusts them horizontally into a bending die. Another cylinder, mounted on the bending die, clamps the parts. The entire die assembly, attached directly to the actuator shaft, rotates upward in a 180° arc by rotation of the bearing-mounted shaft. The parts eject automatically on a downward arc. Then the cycle repeats. The standard model torque actuator operates at 500-psi, it is capable of 280° circular travel. The machine is a product of Walter P. Hill, Detroit. (Ex-Cell-O Corp.).

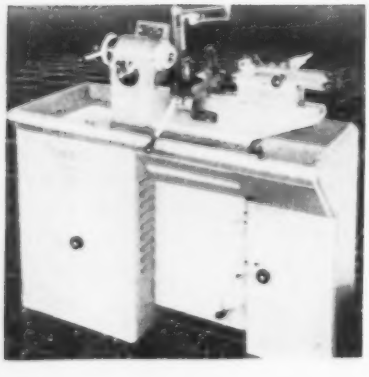
For more data circle No. 39 on postcard, p. 133



Lathe Supports Tool Slides at Both Ends

A fresh concept in vertical chucking machines is introduced by a new automatic vertical production lathe. Cantilever or overhung-type support for the tool slides is eliminated, and tool slides are supported at both ends. This gives them maximum rigidity against cutting forces. Tool position is adjusted by means of calibrated eccentrics. Outstanding sturdiness for making heavy, interrupted cuts is claimed because of this "closed-circuit" support for tool slides. The machine's called the Vertimax; is primarily intended for repetitive production runs. It's economical for small runs as well. Tool slides can be swiveled from below horizontal to beyond the vertical position. This permits simultaneous machining of two internal, two external, or an internal and an external taper, in addition to normal turning and boring. (Cleveland Hobbing Machine Co.)

For more data circle No. 40 on postcard, p. 133



Lathe Offers Infinitely Variable Speed Range

New operational ease and speed are possible with the company's new #94 electric clutch hand turret lathe, through the use of infinitely variable speeds in conjunction with electric clutches for speed changing and reversing functions. Pushbutton operation of a servo-mechanism permits infinite spindle speeds from 140 to 3500 rpm. The constant-speed motor doesn't have to reverse or change speeds; the electric clutch provides immediate high-to-low spindle speed ratio of 5:1. Bed is of flame-hardened, ground Meehanite. Turret and double-action cross slide are new operational components. Cross slide permits holding size closely, yet approaching the cut with speed, according to the manufacturer. (The Wade Tool Co.)

For more data circle No. 41 on postcard, p. 133

TORRINGTON *SPHERICAL ROLLER* BEARINGS

This bearing can take thrust, too!

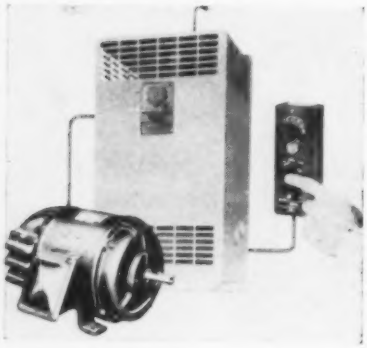
Design is the secret. TORRINGTON Spherical Roller Bearings are made with an integral center flange on the inner race. This assures *positive radial stability and accurate positioning of rollers* wherever high radial load and heavy thrust are encountered under conditions of misalignment.

From crushers to cranes, power shovels to pulverizers, you get long, maintenance-free operation, better performance in your equipment, more value from your bearing dollar when you specify these rugged dependable bearings.

Prove to yourself that TORRINGTON design does make a difference. Next time specify TORRINGTON Spherical Roller Bearings. They're available with either straight or tapered bore, for shaft or adapter mounting.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District offices and distributors in principal cities of United States and Canada

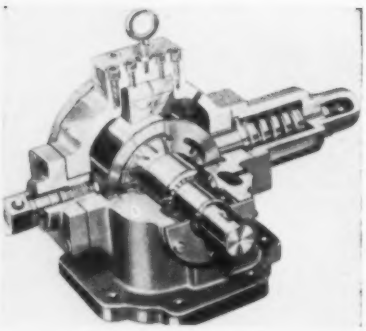
TORRINGTON BEARINGS
Spherical Roller • Tapered Roller • Cylindrical Roller
Needle • Ball • Needle Rollers



Variable-Drive Sprints, Crawls on Command

Wide-range adjustable speed for all machine applications requiring close control of variable speeds, including inching and jogging, is being obtained with a newly redesigned variable-speed electronic drive unit. Maximum size of the new V*S Jr. has been boosted from 3 to 4 hp. Twisting a simple rheostat control takes the unit from as low as 23 rpm, for intermittent set-up duty, to 2300°F for high-speed production. Available in 220 or 440-v models, units are offered in sizes from ¾ through 4 hp. Plugs into any plant ac power line. An auto-transformer comes for use with 110, 380 or 550-v. (Reliance Electric & Engineering Co.)

For more data circle No. 42 on postcard, p. 133



Variable-Volume Pump Has Flow Selector

Advantages in installation and operational economies are cited for a new variable-volume hydraulic pump called Model "R." Pump provides a volume selector adjustment as standard equipment. This permits manually adjusting the pump delivery to the exact circuit requirements. Designed to JIC standards, the new sub-plate mounted pumps are ideal for use in machine tool feed system, hydraulic presses and mobile equipment. Delivery is 40 gpm at 1200 rpm, or 1250 psi intermittently. Pressure-compensating pump governors permit automatic pressure selection. These are hydraulic or electrical. (Racine Hydraulics & Machinery, Inc.)

For more data circle No. 43 on postcard, p. 133

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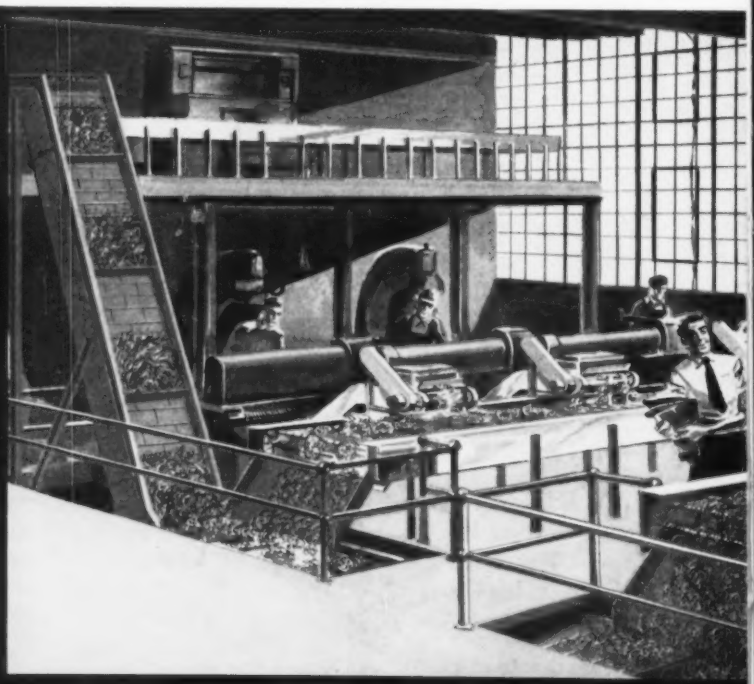
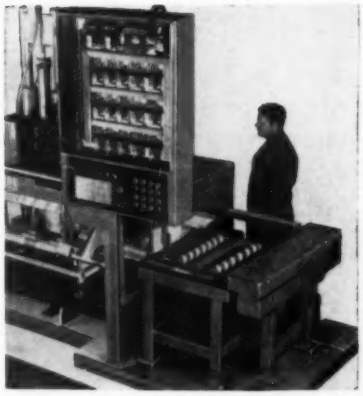
Conveyor Standardization SAVES YOU MONEY...



NOW...

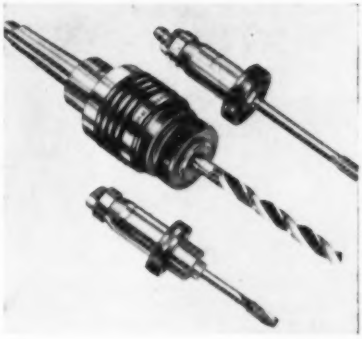
Stacked Sheets Automatically Feed Through Press



Sheets automatically feed from a stack through a press with a new setup. The feeder processes blanks one at a time from the loaded stack, through rolling oils, and then through the press. It also feeds the scrap out of the press. A vacuum lift picks up sheets from the stack and deposits these in a transfer carriage. The carriage, in turn, feeds sheets through the press. The feeder adapts to a wide range of sizes and thicknesses. In addition, the feeder is positioned on rails permitting full access to the press for removing dies. Two pumps hydraulically power the unit. A 10-hp, 1800-rpm electric motor drives these. Quick disconnect fittings permit the feeder to move out of the way quickly for rapid die removal. The machine's size is approximately 8 x 14-ft. (Hautau Engineering Co.)

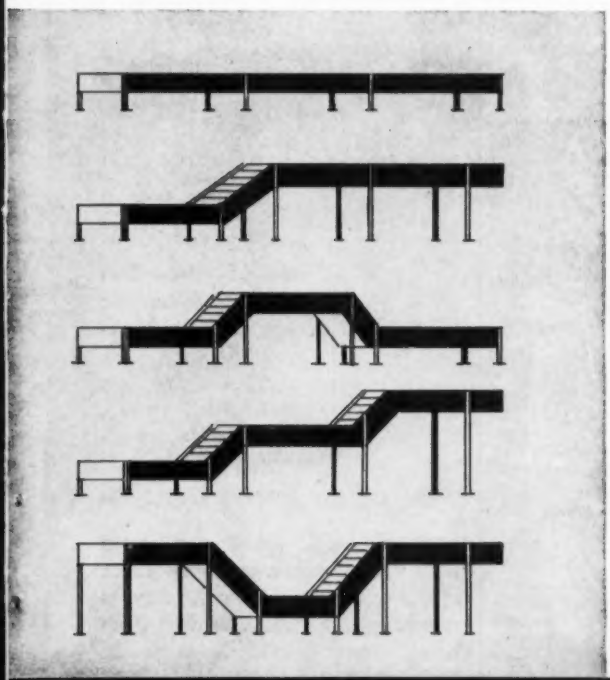
For more data circle No. 44 on postcard, p. 133

Quick-change Chucks Offer High Precision



A new line of precision quick-change chucks added to the company's products offers high-precision and time-saving features. The Haessner chucks have a run-out tolerance of 0.00039-in. The inserts with tools can be changed safely and easily at high rpm's, with no need to stop the machine spindle. They can operate horizontally and vertically, clockwise and counter-clockwise. Operations such as threading, which could not otherwise be done in the same setup as drilling, boring, reaming, etc., thus become possible. A number of inserts and sleeves are available for each tool head. Clamping sleeves stop slipping. (Karl A. Neise)

For more data circle No. 45 on postcard, p. 133



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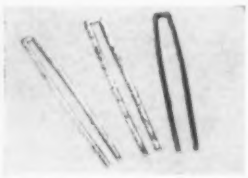

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NEW EQUIPMENT

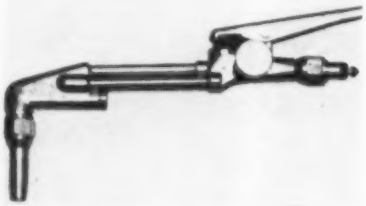
Boring Bars Are Rigid

New boring bars provide great rigidity for heavy, fast cuts and precision adjustment to tenths. The cutter is always "out front." This reduces overhang and provides plenty of chip clearance. It permits the use of a bar with a big diameter shank for extra strength. Standard cutters can be used. Since cutting edges are always "on center" it means less, and sometimes no, tip grinding. Standard capacities of the boring bars range from 25/32 to 6¼ in. in 30 sizes. (Buck Tool Co.).

For more data circle No 46 on postcard, p. 133

Torch Cuts Light Work

For light duty work, this oxyacetylene cutting unit attaches to the company's lightweight welding torch. It weighs 13 oz., and measures 9½-in. long. Cutting range is up to 1-in. steel. Tapered gas sealing rings assure a firm gas-tight



seal; hand tightening makes a firm joint. A diaphragm-type cutting oxygen valve eliminates valve packing and prevents gas leakage. The attachment has head and body brass forgings. (Air Reduction Co., Inc.).

For more data circle No. 47 on postcard, p. 133

Drills Are Extra Long

Several high speed steel extra length drills are recommended for operations where inaccessibility is a problem or for extremely deep holes. They come in straight or taper shank styles and in wire gage or fractional sizes. Diameters range from No. 52 wire gage to 1½ in., overall lengths to 23½ in. (Whitman & Barnes).

For more data circle No. 48 on postcard, p. 133

Going up...

with a lift from FRASSE stock tubing!

Courtesy: Industrial Service Co.

Faced with an almost impossible delivery deadline, the maker of this hydraulic elevator needed a 6" OD ram and a 5" OD ram to telescope. Then too, he knew that final sizing would consume valuable time. With Shelby seamless tubing specified – and speed essential . . . he put in a hurried call to Frasse.

Frasse not only made delivery *immediately* from stock—but was able to *select*, from commercial tolerance material, two tubes so close to final size that only minor honing and turning were necessary. This lift from Frasse stock tubing enabled the elevator to be completely installed, approved . . . *and in operation*, days sooner than had been anticipated.

Tubing stocks at Frasse are in good supply – and quick Frasse delivery helps you get jobs done faster. So, depend on a dependable tubing source – *call Frasse* whenever you need mechanical tubing, stainless tubing, hydraulic and pressure tubing, centrifugally spun tubing – or even a bit of assistance from Frasse tubing specialists. They'll be happy to work with you on any problem involving a tubular product.

Frasse for Tubing...

Seamless and Welded Mechanical Tubing
Pressure, Condenser and Hydraulic Tubes
Stainless Tubing, Seamless and Welded
Stainless Pipe, Valves and Fittings
Aluminum Tubing, Pipe and Fittings
PVC Plastic Pipe, Valves and Fittings

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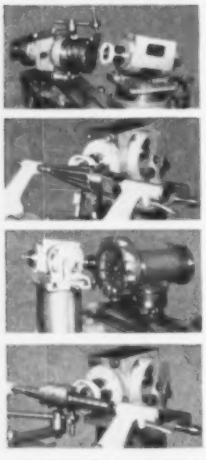
Catalytic Purifier Removes Oxygen In Gas

Catalytic gas purifiers in single-barrel and double-barrel models remove oxygen from a wide variety of gases. These include hydrogen, nitrogen, and argon. Typical applications of the unit for production of oxygen-free hydrogen, inert gas, and mixtures of hydrogen and inert gas include: (1) annealing of stainless alloys; nickel, tantalum, iridium, osmium and their alloys; and precious metals, (2) annealing of parts and components for X-ray and cathode-ray tubes, and (3) sintering and annealing of magnetic alloys. (National Cylinder Gas Co.)

For more data circle No. 49 on postcard, p. 133

Specify this

POPE SUPER PRECISION, 1 HP, 3600 RPM MOTORIZED TOOL AND CUTTER GRINDER CLEARANCE ANGLE SWIVELLING HEAD WITH ANGULAR ADJUSTMENT IN A VERTICAL PLANE



and get these seven savings:

1. Strong, long lasting tool cutting edges because cup wheel cutter grinding can be used for practically all clearance angles.
2. Tooth rest stays on the center line of the cutter for practically all grinding on centers or in the work head.
3. A single set-up grinds most cutters and reamers all over, using the swivelling table and Pope tilting head.
4. No more mistakes on clearance angles. They read directly in degrees from the scale provided on the head.
5. No more trouble or time wasted getting the right clearance angle on the tough ones such as slab mills, **taper reamers,** angular cutters and form tools.
6. No more heat checking of cutters. One safe speed — 3600 RPM — for all wheels generally used on cutter grinders.
7. Quick, easy adjustment saves you time and money every time you grind a tool.

Ask us to send you complete specifications including price and delivery.

No. 118

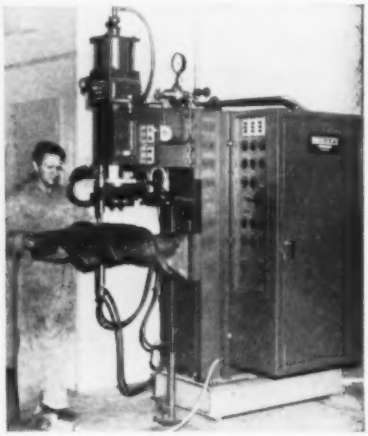
POPE ENGINEERS AND BUILDS STANDARD AND SPECIAL PRECISION ANTI-FRICTION BEARING SPINDLES FOR EVERY PURPOSE

POPE MACHINERY CORPORATION • 261 RIVER STREET • HAVERHILL, MASS.

Established 1920

Joins Wire, Batteries

Fully automatic, a recently introduced resistance welder joins stranded copper leadwire to magnesium-encased batteries at a rate of 3600 per hour. Both parts automatically feed into the wire welder,



the wire feeds from a spool and the batteries from a loading chute. Wire is tin coated and only 0.024-in. in diam. The magnesium case is 0.040-in. thick. Tooling on the machine permits welding two battery sizes, 1 1/32-in. long by 7/16-in. OD, and 1⅞-in. long by ⅝-in. OD. (Taylor-Winfield Corp.)

For more data circle No. 50 on postcard, p. 133

Floor Cuts Wheel Drag

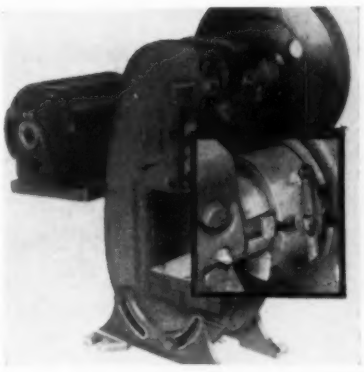
A new flooring material is compounded especially for use in high speed hand and power trucking locations. It applies in a ¼-in. layer over concrete and forms an extremely hard surface. This eliminates wheel drag. (The Monroe Company, Inc.).

For more data circle No. 51 on postcard, p. 133

Press Features Improved-Performance Spring

An outside bridle-type clutch key spring arrangement eliminates the need for old-type clutch springs on their new #00 two-ton Press-Rite press, this manufacturer reports. Advantages include increased tension, allowing for faster engagement and improved spring life. Results are greater strength, positive clutch engagement and a minimum amount of maintenance, says the manufacturer. Other press strong points: Replaceable bronze main bearings, connecting rod and flywheel—and bronze wear strips behind the ramways—provide easy and economical operation. Special, rib-reinforced, high-strength frame gives longer die life, according to the manufacturer of the equipment. (Sales Service Machine Tool Co.)

For more data circle No. 52 on postcard, p. 133



Resin Retards Flames

A resinous compound insulates a metal surface against reaching 1000°F for 30 minutes while being subjected to 2000°F flame. The fire-retardant is a heavy-bodied black mastic. This can be sprayed or trowelled to a thickness of ¼ to ⅜ in. on metal and other materials. It doesn't run, drip, drop off or contribute fuel to the flame. It weathers well, withstands acid and alkali fumes and splash, and will not support mildew. (Insul-Mastic Corp. of America).

For more data circle No. 53 on postcard, p. 133

Unit Welds Superalloy

A new special spot welder boasts a total of 3200 independent settings and a head pressure of 4000 lb. It is versatile enough to weld any of the existing superalloys, say its users. A specialist in the fabrication of prototype engines uses the welder in its production of sheet metal assemblies. These are made of such high temperature alloys as Inconel, Inconel-X, Hastelloy, N-155, and high temperature stainless steels. (Finn Aeronautical Div., T. P. Finn & Co.)

For more data circle No. 54 on postcard, p. 133

Gages Hold Reading

Thirteen new precision mechanical force gages hold their maximum reading after removal of the load. The units have an overall range of measurement capacities from 0-500 gm to 0-200 lb. They make force measurements, both in tension and compression, even in awkward positions where it is difficult to read the

Aluminum heat exchanger parts are fluxed and brazed at the same time in this 50KW Ajax salt bath furnace. Located at the Trane Company, LaCrosse, Wisconsin, the Ajax furnace brazes completed units in a matter of seconds.

FASTER, BETTER BRAZING

for ALUMINUM ASSEMBLIES

Dip brazing boosts output . . . cuts costs . . . assures fast, sound brazes to close tolerances

Dip brazing in Ajax Electric Salt Bath Furnaces puts the fabrication of aluminum assemblies—even highly complicated ones—on a low cost mass production basis.

Assemblies are preheated to 1000°F. then immersed in the molten salt where all joints are brazed quickly and simultaneously. Distortion is minimized because assemblies are heated uniformly by conduction. Thus, polished surfaces, often difficult to heat by radiation, offer no problem. Moreover, extremely close temperature control, inherent with the salt bath method, eliminates the possibility of overheating.

Clean, fast, high quality brazes to uniformly close tolerances are assured.

AJAX ELECTRIC COMPANY

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Associates: Ajax Engineering Corp., Ajax Electrothermic Corp.

AJAX HULTGREN electric SALT BATH furnaces

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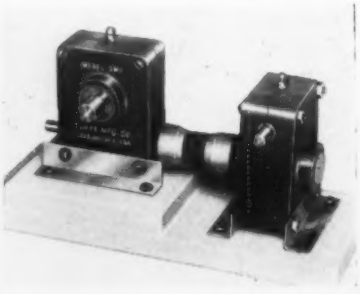
gage in the measuring position, where measurements cannot be held steady or for measuring such momentary loads as peaks and breakpoints. (Hunter Spring Co.)
For more data circle No. 55 on postcard, p. 133

Unit Offers 19 Ratios

A low cost speed reducer for fractional horsepower motors offers the following speed reduction ratios: 15:1, 20:1, 30:1, 48:1, 60:1, 225:1, 300:1, 400:1, 450:1, 600:1, 720:1, 900:1, 960:1, 1200:1, 1440:1,



1800:1, 2304:1, 2880:1, 3600:1. These reducers may be paired in 14 different combinations to produce the additional ratios indicated. The unit combines a precision molded nylon gear with a precision machined steel worm. (Rampe Mfg. Co.).
For more data circle No. 56 on postcard, p. 133

Machine Washes Work

Automatic work and tote pan cleaning is the job of a new machine. It prevents mixing of work and reduces manual handling. The machine receives tote pans of work and dumps the work into a drum type washing section. Then, it carries the upside down tote pan through a conveyor type washing section above the drum section where work is processed. Both work and tote pans get washed, rinsed and dried. Tote pans return to the discharge end of the machine ahead of the parts they formerly contained. Then the clean, dry batch of work is loaded, automatically, into the same, clean and dry tote pan. (Ranshoff, Inc.)
For more data circle No. 57 on postcard, p. 133

One of these 22-B Cranes Answers YOUR Handling Needs

Whether you are handling materials in widely scattered locations, over difficult terrain, or in close quarters, there is a Bucyrus-Erie 22-B crane which will do an outstanding job of handling your particular situation. Each has the power, long reach, and solid construction that help you save money through efficient, long-term service.

253E56-a

22-B TRANSIT CRANE

Reach and Mobility

Combining heavy-duty lifting crane features with rubber-tired mobility, the 22-B Transit Crane handles booms from 30 feet (standard) to 80 feet (with removable inserts), has lifting capacity of 25 tons. Job-to-job moves are fast and convenient.

HEAVY-DUTY 22-B CRANE

Heavy Work

An outstanding performer wherever extra strength and stability are vital, the Heavy-Duty 22-B has high maneuverability on rough or soft terrain. It is equipped with a 35-ft. boom, extendible to 70 feet through use of inserts. Long, flat crawlers with 30-in. treads, friction swing brake, power controlled lowering for the main hoist line, and telescopic pipe boom stops are only a few of its many features.

22-B CRANE

General Service

For a variety of jobs requiring highly dependable service, the standard 22-B crane can't be topped. Carrying a 35-ft. boom extendible to 70 feet, this machine has high maneuverability and great stability as well as independent power boom hoist and many other features you ordinarily find as optional equipment on other cranes.

For complete information on any one or all of these models, see your local Bucyrus-Erie distributor or write direct.

BUCYRUS-ERIE CO. • South Milwaukee, Wis.

See the H-5 Hydrocrane in BOOTH 920 at the National Materials Handling Exposition, Convention Hall, Philadelphia, April 29-May 3.

What's the lowest cost way to produce steel parts like these?

You may be paying considerably more than you need to for parts like these if you aren't taking advantage of Ryerson flame-cutting service.

Size makes no difference—nor intricacy of shape. You can order one part or one thousand and get quick delivery of steel cut to close tolerance—with almost die-cut accuracy from piece to piece. And here's where the saving comes in:

1. **No dies or molds** are needed so you save this cost when you switch from cast or forged parts to flame-cut parts.
2. **Less machining** is usually required to finish a flame-cut part. Sometimes machining is eliminated altogether.
3. **Freight costs lower**—If you're now paying freight on steel you later scrap you may well be able to pay for flame cutting with the money you save by shipping lighter flame-cut parts. The blank for a 6″ disc is 49% heavier than the disc itself. Storage and handling expenses are reduced, too.
4. **Less time in process**—You can often convert finished products into cash more quickly because parts can be produced faster by flame cutting.
5. **No loss on spoilage or rejects**—They're our problem—not yours.
6. **Design changes are simpler** and can be made more frequently without sacrificing manufacturing economy.

You draw on the nation's largest steel stocks at Ryerson—and unequalled flame-cutting facilities are ready to work for you. A blue print or sketch with clearly marked dimensions is all we need for prompt handling of your requirements. Call your nearby Ryerson plant for cost-cutting flame-cut steel today.

In stock: Carbon, alloy and stainless steel—bars, structurals, plates, sheets and strip, tubing, re-bars—industrial plastics, machinery & tools, etc.

RYERSON STEEL

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The Iron Age Summary

Mills Face Up To Market Facts

Salesmen are out beating the bushes to shore up orders for weak products.

Construction, oil and gas, and freight cars will help stave off sharp market drop.

■ Steel mills are facing up to the facts of life this week. Some observers are calling it "enlightened pessimism." In short, recent scrambling to shore up the weak spots in order books has paid off. The mills that can are holding on for dear life to their share of the strong products.

As a result, the decline in new order volume appears to have leveled off, for the time being, at least. There will be still further production declines in April and early May. But overall order volume now suggests that the mills may be in a position to stabilize ingot production by late May or early June.

Market Mainstay—Construction will be the mainstay of the market this summer. Oil and gas and freight car building also will help keep the operating rate at a respectable level. Mills that produce structurals, plate, oil country goods and linepipe will maintain a higher-than-average production rate.

The looked-for pickup in demand from automotive is still "just around the corner." Detroit is holding to its policy of cutting steel inventories. In fact, some excess automotive steel—largely sheets—is being dumped on the market at below-mill prices.

Slow Start—Construction in some areas is getting off to a slow start. This has led to a slight easing in light and standard structurals. The road building program also has bogged down somewhat because of hassles between Federal and state governments over which projects get priority. But these delays are only temporary. The structurals market is expected to revert to its extremely tight status soon.

The oil and gas industries are maintaining a lively pace. The possibility of new pipe lines in the Middle East to by-pass the Suez Canal has injected a psychological factor into the market. Delivery promises on large-diameter linepipe stretch into 1961. Oil country goods have eased slightly, but only to the point where some users are getting enough to more than balance their drilling requirements.

Stainless Sheet Eases—Weakness in sheet and strip spread this week to stainless steel. One mill reports its backlog has slipped to two months, representing a two-week shrinkage. A large Pittsburgh warehouse is going farther afield for stainless sheet orders — as far as Philadelphia.

Steel users are taking advantage of the competitive market in sheet and strip. Some are trying to push second quarter orders into the third quarter. Others have carried inventory cutbacks to the danger point.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,343	2,330	2,407	2,425
Ingot Index				
(1947-1949=100)	145.8	145.0	149.8	151.0
Operating Rates				
Chicago	88.0	86.0*	91.0	100.0
Pittsburgh	95.0	95.0*	99.0	103.0
Philadelphia	102.0	105.0	103.0	100.0
Valley	88.0	82.0*	92.0	98.0
West	102.0	100.0*	102.5	103.0
Buffalo	93.0	93.0	95.0	105.0
Cleveland	91.0	92.0	87.0	104.0
Detroit	96.0	99.0	95.0	97.0
S. Ohio River	64.0	66.0*	80.0	94.5
South	96.0	97.0	95.5	93.0
Upper Ohio R.	96.0	89.0*	95.0	103.0
St. Louis	101.0	101.0	91.0	100.0
Northeast	66.0	66.0	66.0	92.0
Aggregate	91.5	91.0	94.0	98.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.670	5.670	5.670	5.179
Pig Iron (Gross Ton)	$64.56	$64.56	$64.68	$60.29
Scrap, No. 1 hvy (Gross ton)	$42.67	$44.17	$49.50	$54.83
Nonferrous				
Aluminum ingot	27.10	27.10	27.10	25.90
Copper, Electrolytic	32.00	32.00	32.00	46.00
Lead, St. Louis	15.80	15.80	15.80	15.80
Magnesium ingot	36.00	36.00	36.00	33.25
Nickel, electrolytic	74.00	74.00	74.00	64.50
Tin, Straits, N. Y.	99.125	98.875	98.75	99.50
Zinc, E. St. Louis	13.50	13.50	13.50	13.50

*Revised

Plate Users Catch Second Wind

Current slight easing in the plate and structural market is welcomed by consumers.

Prospects for any continuing product easiness, however, appear very remote.

▪ Some plate and structural users are pausing for their second wind in the chase after supplies. The current slight easing in the market—first in about two years—is allowing them to catch their breath. But it's probably only a temporary respite with a long race still to be run.

Right now consumers don't have to push their mills for allotments. Sometimes they are offered some bonus tonnage. The market softening is most noticeable in the light plate area and for structurals up to about 8 in. The heavier and wider items are still tight although even they are in a little better supply.

False Dawn? — Biggest bonanza for light plate users continues to be product rolled on sheet and strip mills. But with any heightened activity in the sheet-strip market this supply source could dry up in a hurry.

The West Coast market—long in short supply on plate and structurals—is also getting some relief. Larger shipments from Eastern mills are taking some of the pressure off local producers. It's enabling them to shorten needed lead time—down to about three months.

This plate and structural easing may be only a false dawn, however. The expected spring upsurge in construction activity, steady product demand from petroleum producers, ship and freight car builders will keep the heat on for a long time to come.

Sheet and Strip—The hoped-for upsurge in cold-rolled sheet hasn't materialized. As a result producers heavy on sheet production are curtailing operations to a degree.

One sheet producer at **Detroit** is stocking semi-finished steel. None of the automotive companies in the area has placed big orders for flat-rolled for May. Only hopeful sign is a report that a large bodymaker has inventories balanced and may increase June orders.

At **Philadelphia** one mill is shutting down an openhearth because of the slackness in sheet and strip. It plans to keep it down until business improves. Even with local mills and warehouses heavy on sheet, there are indications **Pittsburgh** warehouses are looking for business in the Delaware Valley area. Another large **Philadelphia** producer reports customers want to move orders into the third quarter even before the mill has opened up its books for that period.

Pittsburgh producers see cold-rolled sheet orders leveling out at April's low point. Galvanized sheet, which had started to pick up, has sagged. Lower grade silicon sheets are off, but grain oriented sheet is holding its own.

Cold-rolled sheet continues to move in substantial lots at below mill price in the **Chicago** area. Mainly the result of resale of the product by customers supplying automotive industry, it's making warehouse sheet selling difficult. Cold-rolled bookings at the mill level are about three-fourths full for May. Hot-rolled sheet continues at a stronger pace. At least two mills are booked solidly through second quarter on this product. Hot-rolled strip mills, however, are rolling light plate.

Pipe and Tubing — There's a marked improvement in the supply situation for seamless and linepipe.

A **Pittsburgh** oil company which had only enough seamless a month ago to support drilling programs, now reports comfortable inventories. The petroleum producers indicate jobbers are shipping seamless at mill prices, instead of the out-of-stock prices quoted previously. However, for scarce seamless items, oilmen are still paying mechanical tubing prices. And pipe over 20 in. is still very tight.

Philadelphia area mill also reports the seamless market easier. Customers are not as anxious to get tonnage as previously. This mill is discovering some demand to be "phantom" tonnages (duplicate orders placed by the same consumer through different sources).

Stainless—Some slacking off is noted. As in carbon steels, it's the flat-rolled products which are leading the decline. Strip is especially weak. However, plate and tubing are holding up well.

A large producer at **Pittsburgh** has had backlogs cut to two months. This meant a shrinkage of two weeks' worth of orders during the past month alone.

Plates and Structurals — Market easing is being reported by some purchasers.

Consumers at **Pittsburgh** indicate they no longer have to push for their mill allotments.

PURCHASING AGENT'S CHECKLIST

Some signs of easing appear in the structural market. **P. 74**

Memories of '54 slump are haunting cold-rolled strip producers during current slowdown **P. 77**

Metal industry users get a progress report on new developments via Western Metal Congress. **P. 95**

COMPARISON OF PRICES

(Effective April 9, 1957)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	April 9 1957	April 2 1957	Mar. 12 1957	April 10 1956
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.675¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.75	5.325
Galvanized sheets (10 ga.)	6.30	6.30	6.30	5.85
Hot-rolled strip	4.675	4.675	4.675	4.325
Cold-rolled strip	6.870	6.870	6.870	6.28
Plate	4.87	4.87	4.87	4.52
Plates, wrought iron	10.40	10.40	10.40	10.40
Stainl's C-R strip (No. 302)	50.00	50.00	50.00	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$9.95	$9.95	$9.95	$9.45
Tin plates, electro (0.50 lb.)	8.65	8.65	8.65	8.15
Special coated mfg. ternes	9.20	9.20	9.20	8.70
Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	5.075¢	4.65¢
Cold finished bars	6.85	6.85	6.85	5.90
Alloy bars	6.125	6.125	6.125	5.65
Structural shapes	5.00	5.00	5.00	4.60
Stainless bars (No. 302)	43.25	43.25	43.25	38.25
Wrought iron bars	11.50	11.50	11.50	11.50
Wire: (per pound)				
Bright wire	7.20¢	7.20¢	7.20¢	6.60¢
Rails: (per 100 lb.)				
Heavy rails	$5.275	$5.275	$5.275	$4.725
Light rails	6.25	6.25	6.25	5.65
Semifinished Steel: (per net ton)				
Rerolling billets	$74.00	$74.00	$74.00	$68.50
Slabs, rerolling	74.00	74.00	74.00	68.50
Forging billets	91.50	91.50	91.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	107.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.80¢	5.025¢
Skelp	4.225	4.225	4.225	4.225
Finished Steel Composite: (per pound)				
Base price	5.670¢	5.670¢	5.670¢	5.179¢

	April 9 1957	April 2 1957	Mar. 12 1957	April 10 1956
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$68.88	$68.88	$66.88	$65.26
Foundry, Valley	65.00	65.00	65.00	60.50
Foundry, Southern Cin'ti	67.17	67.17	67.17	62.98
Foundry, Birmingham	59.00	59.00	59.00	55.00
Foundry, Chicago	65.00	65.00	65.00	60.50
Basic, del'd Philadelphia	68.38	68.38	68.38	64.48
Basic, Valley furnace	64.50	64.50	64.50	60.00
Malleable, Chicago	65.00	65.00	65.00	60.50
Malleable, Valley	65.00	65.00	65.00	60.50
Ferromanganese, cents per lb‡ 74 to 76 pct Mn base.	12.75¢	12.75¢	12.75¢	9.50¢
Pig Iron Composite: (per gross ton)				
Pig iron	$64.56	$64.56	$64.68	$60.29
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	*$41.50*	$42.50	$50.50	$55.50
No. 1 steel, Phila. area	*47.00*	49.50	53.50	54.50
No. 1 steel, Chicago	*39.50*	40.50	44.50	54.50
No. 1 bundles, Detroit	34.50	34.50	42.50	55.50
Low phos., Youngstown	41.50	41.50	50.50	61.50
No. 1 mach'y cast, Pittsburgh	49.50	49.50	56.50	58.50
No. 1 mach'y cast, Philadel'a	55.50	55.50	57.50	55.50
No. 1 mach'y cast, Chicago	45.50	45.50	49.50	57.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	*$42.67*	$44.17	$49.50	$54.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$15.38	$15.38	$15.38	$14.50
Foundry coke, prompt	$17.50-$19	$17.50-$19	$17.50-$19	$17.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	32.00	32.00	32.00	46.00
Copper, Lake, Conn.	32.00	32.00	32.00	46.00
Tin, Straits, New York	99.125†	98.875	98.75	99.50
Zinc, East St. Louis	13.50	13.50	13.50	13.50
Lead, St. Louis	15.80	15.80	15.80	15.80
Aluminum, virgin ingot	27.10	27.10	27.10	25.90
Nickel, electrolytic	74.00	74.00	74.00	64.50
Magnesium, ingot	36.00	36.00	36.00	33.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	66.50	67.00	67.50	68.00	.....
Birmingham *R3*	58.50	59.00*	.....	.....	.....
Birmingham *W9*	58.50	59.00*	63.00	.....	.....
Birmingham *U4*	58.50	59.00*	63.00	.....	.....
Buffalo *R3*	64.50	65.00	65.50	66.00	.....
Buffalo *H1*	64.50	65.00	65.50	66.00	.....
Buffalo *W6*	64.50	65.00	65.50	66.00	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	64.50	65.00	65.00	65.50	.....
Cleveland *A5*	64.50	65.00	65.00	65.50	69.50†
Cleveland *R3*	64.50	65.00	65.00	65.50	.....
Duluth *I4*	64.50	65.00	65.00	65.50	69.50†
Erie *I4*	64.50	65.00	65.00	65.50	69.50†
Everett *M6*	66.00	66.50	67.00	.....	.....
Fontana *K1*	72.50	73.00	.....	.....	.....
Geneva, Utah *C7*	64.50	65.00	.....	.....	.....
Granite City *G2*	66.40	66.90	67.40	.....	.....
Hubbard *Y1*	.....	.....	65.00	.....	.....
Ironton, Utah *C7*	64.50	65.00	.....	.....	.....
Midland *C11*	64.50	.....	.....	.....	.....
Minnequa *C6*	66.50	67.00	67.50	68.00	.....
Monessen *P6*	64.50	.....	.....	.....	.....
Neville Is. *P4*	64.50	65.00	65.00	65.50	69.50†
N. Tonawanda *T1*	.....	65.00	65.50	66.00	.....
Sharpsville *S3*	64.50	65.00	65.00	65.50	.....
So. Chicago *R3*	64.50	65.00	65.00	.....	.....
Swedeland *A2*	66.50	67.00	67.50	68.00	.....
Toledo *I4*	64.50	65.00	65.00	65.50	.....
Troy, N. Y. *R3*	66.50	67.00	67.50	68.00	72.50
Youngstown *Y1*	.....	.....	65.00	65.50	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. * Add $1.00 for 0.31–0.69 pct phos. † Intermediate low phos. ‡ Add $1.00 for 0.31 to 0.50 pct phos.

Silvery Iron: Buffalo, *H1*, $78.50; Jackson, *J1*, *I4* (Globe Div.), $77.25; Niagara Falls (15.01–15.50), $99.50; Keokuk (14.01–14.50), $110.00; (15.51–16.00), $105.00. Add $1.25 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 14 pct. Add $1.00 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.): $64.00. Add $1.00 premium for all grades silvery 6 pct to 14 pct.

STAINLESS STEEL

Base price cents per lb f.o.b. mill

←To identify producers, see Key on P. 182→

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, rerall.	21.25	22.75	22.25	24.25	—	26.00	38.25	31.00	35.50	—	16.00	27.75	16.25
Slabs, billets	26.00	29.00	27.00	30.25	30.75	32.00	47.50	38.50	44.75	—	20.75	—	21.00
Billets, forging	—	35.00	35.75	36.50	39.50	39.00	59.75	45.25	53.50	30.75	27.25	27.75	27.75
Bars, struct.	40.50	41.25	42.50	43.25	46.25	46.00	70.25	53.25	62.25	36.25	32.50	33.00	33.00
Plates	42.50	43.25	44.50	45.50	48.00	48.75	73.75	57.50	67.00	38.75	33.75	35.50	34.50
Sheets	46.75	47.25	49.25	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Strip, hot-rolled	34.50	37.50	35.75	39.00	—	42.50	66.50	51.50	61.00	—	29.75	—	30.75
Strip, cold-rolled	43.25	47.25	45.75	50.00	—	53.25	78.25	63.00	76.25	46.50	38.75	46.50	39.25
Wire CF; Rod HR	—	39.25	40.25–40.50	41.00–41.25	44.00	43.75	66.75–67.00	50.50–51.00	59.25–59.50	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11*; Brackenridge, Pa., *A3*; Butler, Pa., *A7*; Vandergrift, Pa., *U1*; Washington, Pa., *W2*, *J3*; Baltimore, *E1*; Middletown, O., *A7*; Massillon, O., *R3*; Gary, *U1*; Bridgeville, Pa., *U2*; New Castle, Ind., *I2*; Ft. Wayne, *J4*; Philadelphia, *D5*.

Strip: Midland, Pa., *C11*; Waukegan, Cleveland, *A5*; Carnegie, Pa., *S9*; McKeesport, Pa., *F1*; Reading, Pa., *C2*; Washington, Pa., *W2*; W. Leechburg, Pa., *A3*; Bridgeville, Pa., *U2*; Detroit, *M2*; Canton-Massillon, O., *R3*; Harrison, N. J., *D3*; Youngstown, *C5*; Sharon, Pa., *S1*; Butler, Pa., *A7*; Wallingford, Conn., *U3* (plus further conversion extras); *W1*; New Bedford, Mass. (.25¢ per lb higher), *R6*; Gary, *U1* (.25¢ per lb higher).

Bar: Baltimore, *A7*; S. Duquesne, Pa., *U1*; Munhall, Pa., *U1*; Reading, Pa., *C2*; Titusville, Pa., *U2*; Washington, Pa., *J2*; McKeesport, Pa., *U1*, *F1*; Bridgeville, Pa., *U2*; Dunkirk, N. Y., *A3*; Massillon, O., *R3*; S. Chicago, *U1*; Syracuse, N. Y., *C11*; Watervliet, N. Y., *A3*; Waukegan, *A5*; Canton, O., *T5*; Ft. Wayne, *I4*; Philadelphia, *D5*; Detroit, *R3*; Gary, *U1*.

Wire: Waukegan, *A5*; Massillon, O., *R3*; McKeesport, Pa., *F1*; Ft. Wayne, *J4*; Harrison, N. J., *D3*; Baltimore, *A7*; Dunkirk, *A3*; Monessen, *P1*; Syracuse, *C11*; Bridgeville, *U2*.

Structurals: Baltimore, *A7*; Massillon, O., *R3*; Chicago, Ill., *J4*; Watervliet, N. Y., *A3*; Syracuse, *C11*; S. Chicago, *U1*.

Plates: Brackenridge, Pa., *A3*; Chicago, *U1*; Munhall, Pa., *U1*; Midland, Pa., *C11*; New Castle, Ind., *I2*; Middletown *A7*; Washington, Pa., *J2*; Cleveland, Massillon, *R3*; Coatesville, Pa., *C15*; Philadelphia, *D5*; Vandergrift, Pa., *U1*; Gary, *U1*.

Forgings billets: Midland, Pa., *C11*; Baltimore, *A7*; Washington, Pa., *J2*; McKeesport, *F1*; Massillon, Canton, O., *R3*; Watervliet, *A3*; Pittsburgh, Chicago, *U1*; Syracuse, *C11*; Detroit, *R5*; Munhall, Pa., *S*. Chicago, *U1*.

Dealers Balk At Low Price Levels

Opposition to lower prices grows in Midwest. Dealers are beginning to hold stocks.

Decline continues in East. Composite drops to 1955 level.

■ Some signs of a leveling market are appearing in the Midwest. In Chicago and other markets, some of the braver dealers are beginning to hold on to scrap in hopes of higher prices.

This indication that the bottom of the market may be approaching is not completely general, however. On the East Coast, where the decline was less rapid, the trade is more bearish and the market drop more significant.

There is little evidence in Philadelphia of any determined resistance to lower prices. Dealers are still willing to sell. Unless stronger export bolsters the market, the bottom may not be in sight there.

Whether the trade will live up to its tough talk remains to be seen. But offers at lower prices are getting negative responses in some markets. In others, orders at quoted levels have materialized to have at least a temporary firming effect.

THE IRON AGE composite price declined to $42.67, principally on a $2.50 drop in Philadelphia. This is the lowest since summer of 1955.

Pittsburgh—Prices of most scrap grades continue to slide. A mill on the fringe of the district bought No. 1 heavy melting at $44, but the tonnage was too small to affect the market and the price of this grade dropped to $42. There is talk that dealers and generators may begin to lay down the better grades, but at the moment supply appears to meet demand. One mill temporarily suspended shipments to add to the gloom. Railroad grades are off sharply on early lists.

Chicago—In a relatively dull market, prices failed to show great change. One factor appeared to be gaining strength; tendency on the part of dealers to lay down scrap rather than sell at going prices. Dealer reports of intentions to lay down electric furnace cast grades and even turnings are increasingly common.

Philadelphia—Mill buying was almost non-existent in this market except for a small but firm purchase of No. 1 heavy melting at $47.50. It set a price $2.50 lower than last week. Spot purchases of other grades sent most other prices sliding. The combination of low prices and heavy rains caused collections to drop off from 25 to 40 pct.

New York—Steelmaking and blast furnace grades have declined another dollar. But it is expected that supplies will start to dry up at these prices. Price of mixed yard cast in April 4 issue should have been $40.00 to $41.00.

Detroit—Prices are unchanged for steelmaking grades this week as two local mills made token buys of No. 1 and No. 2 grades. Brokers paid an FOB price of $35 and $26 respectively for the material, but were out of the market in a very short time. Some cast grades dropped $2 on appraisal.

Cleveland—The market slowed to a walk with most buying being done by brokers for out-of-district shipment. Continued bad weather is idling dealer yards. One local foundry purchased 2-ft foundry steel at $44.00 delivered with an extra $1 springboard. General foundry purchasing is still good.

St. Louis—The market continues to show weakness. Prices are from $1 to $3 down from a week ago. Mills seem content to work off present inventories, which are reported to be good. Heavy rains and lower prices have slowed movement of scrap.

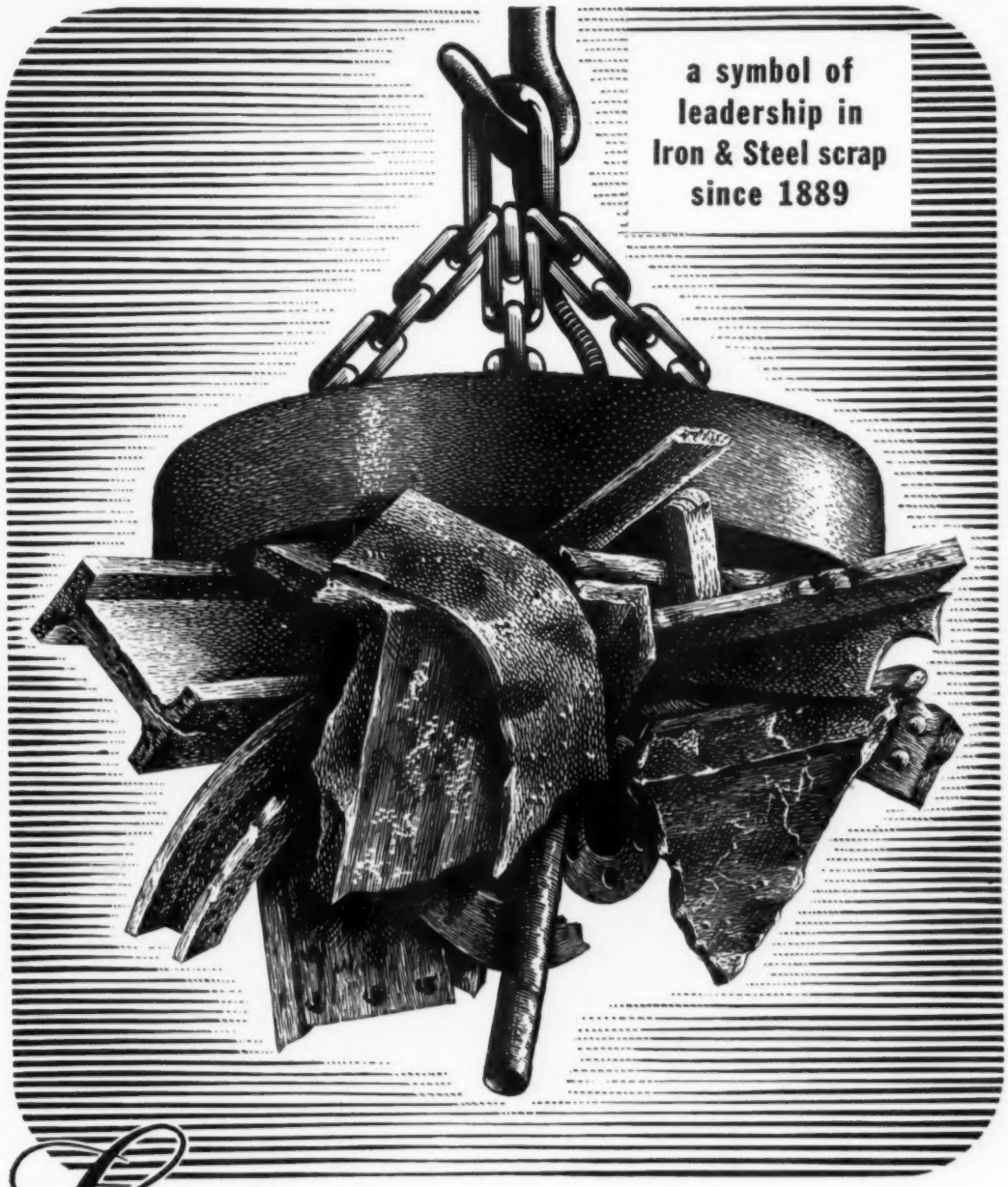
Birmingham—The market continues downward in this district and no factors are apparent that are likely to change the trend. Dealers in coastal area were heartened this week by a renewal of export buying in some ports, although prices were lower than last quotations. Electric furnace grades are moving fairly well at lower prices. Cast is holding steady.

Cincinnati—One local mill came into the market for a good tonnage at prevailing prices. This revised dealer hopes that the end of the decline may be near. Hope is that the market is stabilized for the month. Purchase was in No. 1 and No. 2 heavy melting and No. 2 bundles.

Buffalo—All No. 1 steelmaking grades slipped $2 per ton on the basis of purchases by the area's largest mill. Also off $2 are all rail items, low phos, cupola and machinery cast. Turnings are off $1 in a steadily weakening market. Some of the trade believe further drops are in the offing.

Boston—The market continues very slow. The market is off $1 on No. 1 steelmaking grades. Although there were some sales at $38, they were not representative tonnages. Export is practically nil and further declines are expected.

West Coast—Mills and dealers report the new price schedule is firm. They expect prices to remain at present levels for a couple of weeks. Export continues active, although not at the brisk pace of the past few months.



Luria Brothers and Company, Inc.

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EXPORTS-IMPORTS LIVINGSTON & SOUTHARD, INC. 99 Park Ave., New York, N. Y. *Cable Address:* **FORENTRACO**

SCRAP PRICES *(Effective April 9, 1957)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 dealer bundles	41.00 to 42.00
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	33.00 to 34.00
No. 1 busheling	41.00 to 42.00
Machine shop turn.	27.00 to 28.00
Mixed bor. and ms. turn.	27.00 to 28.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	31.00 to 32.00
Low phos. punch'gs plate	45.00 to 46.00
Heavy turnings	36.00 to 37.00
No. 1 RR. hvy. melting	42.00 to 44.00
Scrap rails, random lgth.	59.00 to 60.00
Rails 2 ft and under	61.00 to 62.00
RR. steel wheels	56.00 to 57.00
RR. spring steel	56.00 to 57.00
RR. couplers and knuckles	56.00 to 57.00
No. 1 machinery cast.	50.00 to 51.00
Cupola cast	43.00 to 44.00
Heavy breakable cast.	41.00 to 42.00

Chicago

No. 1 hvy. melting	$39.00 to $40.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	40.00 to 41.00
No. 1 factory bundles	45.00 to 46.00
No. 2 bundles	34.00 to 35.00
No. 1 busheling	39.00 to 40.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	25.00 to 26.00
Shoveling turnings	25.00 to 26.00
Cast iron borings	25.00 to 26.00
Low phos. forge crops	53.00 to 54.00
Low phos. punch'gs plate	47.00 to 48.00
Low phos. 3 ft and under	46.00 to 47.00
No. 1 RR. hvy. melting	46.00 to 47.00
Scrap rails, random lgth.	53.00 to 54.00
Rerolling rails	56.00 to 57.00
Rails 2 ft and under	56.00 to 57.00
Locomotive tires cut	51.00 to 52.00
Cut bolsters & side frames	49.00 to 50.00
Angles and splice bars	54.00 to 55.00
RR. steel car axles	70.00 to 71.00
RR. couplers and knuckles	48.00 to 49.00
No. 1 machinery cast.	45.00 to 46.00
Cupola cast	39.00 to 40.00
Heavy breakable cast.	38.00 to 39.00
Cast iron brake shoe	39.00 to 40.00
Cast iron wheels	47.00 to 48.00
Malleable	54.00 to 55.00
Stove plate	39.00 to 40.00
Steel car wheels	51.00 to 52.00

Philadelphia Area

No. 1 hvy. melting	$46.50 to $47.50
No. 2 hvy. melting	36.00 to 38.00
No. 1 dealer bundles	46.50 to 47.50
No. 2 bundles	34.00 to 36.00
No. 1 busheling	46.50 to 47.50
Machine shop turn.	32.00 to 33.00
Mixed bor. short turn.	34.00 to 35.00
Cast iron borings	34.00 to 35.00
Shoveling turnings	36.00 to 37.00
Clean cast chem. borings	39.00 to 40.00
Low phos. 5 ft and under	52.00 to 53.00
Low phos. 2 ft and under	53.00 to 54.00
Low phos. punch'gs	53.00 to 54.00
Elec. furnace bundles	49.00 to 50.00
Heavy turnings	43.50 to 44.50
RR. steel wheels	58.00 to 59.00
RR. spring steel	58.00 to 59.00
Rails 18 in. and under	66.00 to 67.00
Cupola cast	45.00 to 46.00
Heavy breakable cast.	54.00 to 55.00
Cast iron car wheels	60.00 to 61.00
Malleable	61.00 to 62.00
Unstripped motor blocks	37.00 to 38.00
No. 1 machinery cast.	55.00 to 56.00

Cleveland

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 dealer bundles	37.00 to 38.00
No. 1 factory bundles	44.50 to 45.50
No. 2 bundles	30.00 to 31.00
No. 1 busheling	37.00 to 38.00
Machine shop turn.	24.00 to 25.00
Mixed bor. and turn.	27.50 to 28.50
Shoveling turnings	27.50 to 28.50
Cast iron borings	27.50 to 28.50
Cut struct'r'l & plates, 2 ft & under	49.00 to 50.00
Drop forge flashings	37.00 to 38.00
Low phos. punch'gs, plate	38.00 to 39.00
Foundry steel, 2 ft & under	43.00 to 44.00
No. 1 RR. heavy melting	44.00 to 45.00
Rails 2 ft and under	66.00 to 67.00
Rails 18 in. and under	67.00 to 68.00
Railroad grate bars	32.00 to 33.00
Steel axle turnings	30.00 to 31.00
Railroad cast	53.00 to 54.00
No. 1 machinery cast.	51.00 to 52.00
Stove plate	48.00 to 49.00
Malleable	54.00 to 55.00

Youngstown

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	33.00 to 34.00
Machine shop turn.	22.00 to 23.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	41.00 to 42.00

Buffalo

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	35.00 to 36.00
No. 1 busheling	41.00 to 42.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	31.00 to 32.00
Cast iron borings	27.00 to 28.00
Low phos. plate	46.00 to 47.00
Scrap rails, random lgth.	56.00 to 57.00
Rails 2 ft and under	60.00 to 61.00
RR. steel wheels	49.00 to 50.00
RR. spring steel	49.00 to 50.00
RR. couplers and knuckles	49.00 to 50.00
No. 1 machinery cast.	46.00 to 47.00
No. 1 cupola cast.	42.00 to 43.00

Detroit

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	34.00 to 35.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	34.00 to 35.00
Drop forge flashings	34.00 to 35.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	23.00 to 24.00
Cast iron borings	23.00 to 24.00
Low phos. punch'gs, plate	34.00 to 35.00
No. 1 cupola cast.	46.00 to 47.00
Heavy breakable cast.	42.00 to 43.00
Stove plate	43.00 to 44.00
Automotive cast.	52.00 to 53.00

St. Louis

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.00 to 38.00
No. 1 dealer bundles	41.00 to 42.00
No. 2 bundles	32.00 to 33.00
Machine shop turn.	23.00 to 24.00
Cast iron borings	25.00 to 26.00
Shoveling turnings	25.00 to 26.00
No. 1 RR. hvy. melting	44.00 to 45.00
Rails, random lengths	48.00 to 49.00
Rails 18 in. and under	58.00 to 59.00
Locomotive tires uncut	50.00 to 51.00
Angles and splice bars	54.00 to 55.00
Std. steel car axles	67.00 to 68.00
RR. specialties	50.00 to 51.00
Cupola cast	42.00 to 43.00
Heavy breakable cast.	39.00 to 40.00
Cast iron brake shoes	41.00 to 42.00
Stove plate	38.00 to 39.00
Cast iron car wheels	43.00 to 44.00
Rerolling rails	58.00 to 59.00
Unstripped motor blocks	35.00 to 36.00

Boston

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	29.00 to 30.00
No. 1 busheling	36.00 to 37.00
Elec. furnace, 3 ft & under	40.00 to 41.00
Machine shop turn.	20.00 to 21.00
Mixed bor. and short turn.	23.00 to 24.00
Shoveling turnings	24.00 to 25.00
Clean cast. chem. borings	28.00 to 29.00
No. 1 machinery cast.	43.00 to 44.00
Mixed cupola cast.	35.00 to 36.00
Heavy breakable cast.	43.00 to 44.00
Stove plate	33.00 to 34.00
Unstripped motor blocks	26.00 to 27.00

New York

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$43.00 to $44.00
No. 2 hvy. melting	33.00 to 34.00
No. 2 dealer bundles	30.00 to 31.00
Machine shop turn.	23.00 to 24.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	26.00 to 27.00
Clean cast chem. borings	30.00 to 31.00
No. 1 machinery cast.	44.00 to 45.00
Mixed yard cast.	39.00 to 40.00
Charging box cast.	44.00 to 45.00
Heavy breakable cast.	44.00 to 45.00
Unstripped motor blocks	31.00 to 32.00

Birmingham

No. 1 hvy. melting	$40.00 to $41.00
No. 2 hvy. melting	33.00 to 34.00
No. 1 dealer bundles	40.00 to 41.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	40.00 to 41.00
Machine shop turn.	27.00 to 28.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	27.00 to 28.00
Electric furnace bundles	43.00 to 44.00
Bar crops and plate	46.00 to 47.00
Structural and plate, 2 ft	45.00 to 46.00
No. 1 RR. hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	49.00 to 50.00
Rails, 18 in. and under	53.00 to 54.00
Angles & splice bars	52.00 to 53.00
Rerolling rails	58.00 to 59.00
No. 1 cupola cast.	48.00 to 49.00
Stove plate	47.00 to 48.00
Charging box cast.	37.00 to 38.00
Cast iron car wheels	37.00 to 38.00
Unstripped motor blocks	38.00 to 39.00
Mashed tin cans	15.00 to 16.00
Elec. furnace, 2 ft & under	41.00 to 42.00

Cincinnati

Brokers buying prices per gross ton, on cars:

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	28.00 to 29.00
Machine shop turn.	25.00 to 26.00
Mixed bor. and turn.	23.00 to 24.00
Shoveling turnings	28.00 to 29.00
Cast iron borings	23.00 to 24.00
Low phos. 18 in. & under	48.00 to 49.00
Rails, random lengths	53.00 to 54.00
Rails, 18 in. and under	63.00 to 64.00
No. 1 cupola cast.	43.00 to 44.00
Hvy. breakable cast.	41.00 to 42.00
Drop broken cast.	55.00 to 56.00

San Francisco

No. 1 hvy. melting	$51.00
No. 2 hvy. melting	46.00
No. 1 dealer bundles	50.00
No. 2 bundles	38.00
Machine shop turn.	35.00
Cast iron borings	33.00 to 35.00
No. 1 RR. hvy. melting	51.00
No. 1 cupola cast.	57.00

Los Angeles

No. 1 hvy. melting	$51.00
No. 2 hvy. melting	46.00
No. 1 dealer bundles	50.00
No. 2 bundles	36.00
Machine shop turn.	35.00
Shoveling turnings	37.00
Cast iron borings	34.00
Elec. furn. 1 ft. and under (foundry)	62.00
No. 1 RR. hvy. melting	51.00
No. 1 cupola cast.	54.00 to 56.00

Seattle

No. 1 hvy. melting	$51.00
No. 2 hvy. melting	45.00
No. 2 bundles	$30.00 to 32.00
No. 1 cupola cast.	52.00
Mixed yard cast.	52.00

Hamilton Ont.

No. 1 hvy. melting	$43.00
No. 2 hvy. melting	38.00
No. 1 dealer bundles	43.00
No. 2 bundles	32.00
Mixed steel scrap	40.00
Busheling	34.00
Bush., new fact., prep'd	43.00
Bush., new fact., unprep'd	37.00
Machine shop turn.	22.00
Short steel turn.	30.00
Mixed bor. and turn.	24.00
Rails, rerolling	54.00
Cast scrap	50.00

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Brass Mills Offer Less for Scrap

Shifting brass mill market prompts scrap buyers to play it by ear.

Result: Each mill has a different policy.

Most are buying only small lots from dealers, and are offering ½¢ to 1½¢ below their own published prices.

■ In the current shifting brass mill market, scrap purchasing agents are playing it by ear. The result: Each mill has a slightly different scrap buying policy.

Business Spotty—After a slow January and February, brass mill business began to pick up in March. But the improvement is spotty. Outlook for continued improvement in April and May is good. But until the upturn has reached all mills, the scrap situation, from the dealers standpoint will remain confused.

Most of the mills say they are getting almost enough scrap from their customers. For this they are paying their published prices because, (1) it is scrap generated from their own mill products so precise analysis is known, and (2) with business spotty it is wise to keep customers happy by supplying a market for their scrap.

Some Hold Price—A few of the biggest mills maintain a standard policy for purchase of dealer scrap. They either buy at their published prices, or not at all. The only deviation is an occasional premium paid for high grade material.

Mills whose shipments have headed up substantially are in the market. But the others are getting just about enough from their customers, buy only occasional small lots from dealers.

Average 1¢ Less—Most mills are buying just what they can use, and offering the dealer around ½c to 1½¢ below their published price. These mills concede that if the market strengthens, or if enough dealers refuse to sell, they will boost their price. Tonnages involved depend again on the extent of improved shipments. Outlook here is good.

A few mills are balancing the scales against 1955 when dealer material brought more than the virgin metal price. These mills are in the market, but are offering dealers well below their published prices. They peg the price so as to generate more scrap than they can use, but not too much to overtax their storage facilities. Outlook here is perhaps the best. Mills which are beginning to feel the upswing in business are upping prices. Some say they will probably be buying just what they need, at close to published prices within a month or so.

Aluminum Ingot Off—Aluminum ingot makers report demand from their biggest market, the diecasters, sagged badly in the last few days. As a result, ingot makers have dropped the price offered for scrap. Clips and turnings are weakest grades, both off 1¢ per lb. Mixed old cast slid ½¢ per lb. Ingot makers attribute the drop in diecaster demand to fact that expected spring business boost is not yet evident.

Aluminum

The government has removed quantitative limits on export of aluminum scrap and remelt ingots originating in a U. S. territory or possession.

Offshore material had been included in the 8000 ton quota. Government says improved supplies in this country caused the switch. Quota still applies to domestic scrap.

The first winner of the R. S. Reynolds Memorial Award is the Spanish architectural firm of Cesar Ortiz-Echague, Manuel Barbero y Rafael de la Joya. Recipients get $25,000 and an emblem in the form of an original piece of sculpture.

The prize, in honor of the founder of Reynolds Metals Co., is intended to recognize the architect who makes "the most significant contribution to the use of aluminum, esthetically or structurally, in the building field."

Winning entry was called the first building in Spain with aluminum frame and roof. It is the Visitors and Factory Lounge Center for S.E.A.T. Automovil Factory, Barcelona. It qualified on both criteria, said the judges.

Zinc

The American Zinc Institute reports total shipments in March were highest for any month in 1957. In addition, they topped the same month in 1956.

Metal shipped to the govern-

Primary Prices

(cents per lb)	Current price	last price	date of change
Aluminum ingot	27.10	25.90	8 10 56
Aluminum pig	25.00	24.00	8 10 56
Copper (E)	32.00	34.00	2 18 57
Copper (CS)	31.50-32.00	31.50	4 2 57
Copper (L)	32.00	34.00	2 19 57
Lead, St. L.	15.80	16.30	1 13 56
Lead, N. Y.	16.00	16.50	1 13 56
Magnesium ingot	36.00	34.50	8 13 56
Magnesium pig	35.25	33.75	8 13 56
Nickel	74.00	64.50	12 6 56
Titanium sponge	250-275	270-330	12 4 56
Zinc, E. St. L.	13.50	13.00	1 6 56
Zinc, N. Y.	14.00	13.50	1 6 56

ALUMINUM: 99½ ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic, (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig. Velasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see next page; other primary prices, pg. 178.

ment's account more than doubled February. Production of slab zinc by smelters also hit a new 1957 high.

But on the other side of the ledger, the smelters finished the month with increased inventories. And domestic shipments, keystone of the market, were off slightly.

With the high production and fall-off in domestic shipments, the government acceptance of more zinc appeared to make the difference. This is not viewed as a healthy situation since the extent of future government buying is in doubt. The industry is hoping for a pickup in domestic shipments once nicer weather hits.

The year thus far (in short tons):

	Stock Beginning	Production	Shipments Domestic
Jan.	68,622	93,452	67,373
Feb.	78,974	88,078	67,731
Mar.	86,889	96,715	67,097
	Export	Gov't.	Total
Jan.	450	15,377	83,100
Feb.	1,527	10,905	80,163
Mar.	1,558	25,608	94,263
	Stock Ending	Unfilled Orders	
Jan.	78,974	42,922	
Feb.	86,889	56,421	
Mar.	89,341	56,818	

By Grades—Production of prime western zinc rose from 41,483 tons in February to 48,504 tons in March. But shipments also climbed. Stocks at smelters dropped to 48,678 tons at the end of March, from 49,715 at March 1. High grade zinc was weakest grade. Smelter inventory rose to 10,807 tons from 7002 tons, despite a 531 ton drop in output.

Correction

March average prices for electrolytic copper, delivered Conn. Valley; and lake copper were incorrectly reported in April 4 issue. Both are 32¢ per lb.

Tin prices for the week: April 3—98.75; April 4—98.375; April 5—98.50; April 8—99.00; April 9—99.125.*

* Estimate

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*Registered Trade Mark of the General Railway Signal Company

NONFERROUS PRICES *(Effective April 9, 1957)*

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	032	081	136-249	250-3
1890, 1100, 3003	44 3	42 1	40 9	40 2
5052	51 8	46 8	45 1	42 9
6061-0	48 9	44 6	42 8	42 6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42 7-44 4	57 6-61 1
12-14	43 4-44 8	58 4-62 7
24-26	46 4-46 9	68 7-73 1
36-38	54 8-55 4	91 5-94 9

Screw Machine Stock—2011-T-3

Size"	1/4	5/8-5/8	3/4-1	1 1/4-1 1/2
Price	59 7	58 8	57 4	55 2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length" →	72	96	120	144
.019 gage	$1 352	$1 803	$2 254	$2 704
.024 gage	1 686	2 252	2 815	3 378

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type ↓ Gage →	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade		67 9	69 0	77 9	103 1
AZ31B Spec.		93 3	95 7	108 7	171 3
Tread Plate		70 6	71 7		
Tooling Plate	73 0				

Extruded Shapes

factor →	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69 6	70 7	75 6	89 2
Spec. Grade (AZ31B)	84 6	85 7	90 6	104 2

Alloy Ingot

AZ91B (Die Casting) 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks		87	

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	54 13		51 36	54 32
Brass, 70/30	47 52	48 06	47 46	50 43
Brass, Low	50 20	50 74	50 14	53 01
Brass, R L	51 14	51 68	51 08	53 95
Brass, Naval	51 69		46 00	55 10
Muntz Metal	49 79		45 60	
Comm. Bz.	52 63	53 17	52 57	55 19
Mang. Bz.	55 43		49 53	
Phos. Bz. 5%	73 17		73 67	

Free Cutting Brass Rod $37.68

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, $11.00-$12.10; alloy, $14.75; Plate, HR, commercially pure, $9.25-$9.75; alloy, $11.25. Wire, rolled and/or drawn, commercially pure, $8.50-$9.00; alloy, $11.00; Bar, HR or forged, commercially pure, $7.10-$7.35; alloy, $7.10-$7.30; billets, HR, commercially pure, $6.85-$7.10; alloy, $6.85-$7.05.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex... 33.50
Beryllium aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb conta'd Be.$43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots .....$ 2.25
Cadmium, del'd .....$ 1.70
Calcium, 99.9%, small lots .....$ 4.55
Chromium, 99.8% metallic basis ...$ 1.31
Cobalt, 97-99% (per lb) ....$2.00 to $2.07
Germanium, per gm, f.o.b. Miami, Okla., refined .....$48.50-$53.50
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9% dollars per troy oz...$ 2.25
Iridium, dollars per troy oz....$90 to $100
Lithium, 98% .....$11.00 to $14.00
Magnesium, sticks, 100 to 500 lb... 59.00
Mercury, dollars per 76-lb flask, f.o.b. New York .....$255 to $257
Nickel oxide sinter at Copper Cliff, Ont., contain'd nickel 71.25
Palladium, dollars per troy oz...$23 to $24
Platinum, dollars per troy oz....$92 to $95
Rhodium .....$120.00 to $125.00
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Uranium, normal per kg. $40.00
Vanadium .....$ 3.45
Zirconium sponge $10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115 ..... 31.50
No. 120 ..... 30.00
No. 123 ..... 28.50
80-10-10 ingot
No. 305 ..... 35.50
No. 315 ..... 33.50
88-10-2 ingot
No. 210 ..... 43.25
No. 215 ..... 40.00
No. 245 ..... 35.50
Yellow ingot
No. 405 ..... 25.25
Manganese bronze
No. 421 ..... 28.50

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max. 24.75-25.50
0.60 copper max. 24.50-25.25
Piston alloys (No. 122 type)...22.25-23.50
No. 12 alum. (No. 2 grade) ...22.50-23.00
108 alloy 22.50-23.00
195 alloy 24.50-25.75
13 alloy (0.60 copper max.)....24.50-25.25
AXS-679 .....22.50-23.00

Steel deoxidizing aluminum, notch bar granulated or shot
Grade 1—95-97½% 23.00-23.75
Grade 2—92-95% 21.75-22.00
Grade 3—90-92% 20.75-21.50
Grade 4—85-90% 20.25-20.75

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	28	27¼
Yellow brass	21⅞	20⅛
Red brass	25	24¼
Comm. bronze	25⅞	25⅛
Mang. bronze	20½	19¾
Yellow brass rod ends	21⅝	....

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27¼
No. 2 copper wire 25¾
Light copper 23½
*Refinery brass 24¾
Copper bearing material 24
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27½
No. 2 copper wire 25¾
Light copper 23½
No. 1 composition 23½
No. 1 comp. turnings 23
Hvy. yellow brass solids 17½
Brass pipe 19
Radiators 18½
Aluminum
Mixed old cast. ..... 14 —14½
Mixed new clips ..... 15½—16
Mixed turnings, dry ..... 14½—15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 24 —24¼
No. 2 copper wire ..... 22½—23
Light copper .....20¾—21¼
Auto radiators (unsweated).. 15¾—16
No. 1 composition ..... 21 —21½
No. 1 composition turnings... 20½—21
Cocks and faucets ..... 16½—17
Clean heavy yellow brass.... 14½—15
Brass pipe ..... 17 —17½
New soft brass clippings .... 19 —19½
No. 1 brass rod turnings .... 16¼—16½

Aluminum

Alum. pistons and struts .... 5½— 6
Aluminum crankcases ..... 10½—11
1100 (2S) aluminum clippings 13½—14
Old sheet and utensils ..... 10½—11
Borings and turnings ..... 6½— 7
Industrial castings ..... 10½—11
2024 (24S) clippings ..... 12 —12½

Zinc

New zinc clippings ..... 6½— 7
Old zinc ..... 4½— 5
Zinc routings ..... 2½— 2¾
Old die cast scrap ..... 2¼— 2½

Nickel and Monel

Pure nickel clippings ..... $1.15-$1.25
Clean nickel turnings ..... $1.10-$1.15
Nickel anodes ..... $1.15-$1.25
Nickel rod ends ..... $1.15-$1.25
New Monel clippings 50-55
Clean Monel turnings 45-50
Old sheet Monel 50-55
Nickel silver clippings, mixed. 21
Nickel silver turnings, mixed. 18

Lead

Soft scrap lead ..... 12 —12½
Battery plates (dry) ..... 6½— 6¾
Batteries, acid free ..... 3¾— 4

Miscellaneous

Block tin ..... 75 —76
No. 1 pewter ..... 59 —60
Auto babbitt ..... 39 —40
Mixed common babbitt ..... 12 —12½
Solder joints ..... 17½—18
Siphon tops 42
Small foundry type ..... 14¼—14½
Monotype ..... 14 —14½
Lino. and stereotype ..... 13 —13½
Electrotype ..... 12½—12¾
Hand picked type shells ..... 9½—10
Lino. and stereo. dross ..... 4¾— 5
Electro. dross ..... 4 — 4¼

IRON AGE

STEEL PRICES

(Effective April 9, 1957)

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		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$107.00 *B3*		5.05 *B3*	7.40 *B3*	5.05 *B3*						
	Buffalo, N. Y.	$74.00 *B3, R3*	$91.50 *B3, R3*	$107.00 *B3, R3*	5.90 *B3*	5.05 *B3*	7.40 *B3*	5.05 *B3*	4.675 *B3, R3*	6.85 *R7*	6.95 *B3*			
	Claymont, Del.													
	Harrison, N. J.													14.55 *C11*
	Conshohocken, Pa.		$96.50 *A2*	$114.00 *A2*					4.725 *A2*	6.90 *A2*	6.95 *A2*			
	New Bedford, Mass.									7.30 *R6*				
	Johnstown, Pa.	$74.00 *B3*	$91.50 *B3*	$107.00 *B3*		5.05 *B3*	7.40 *B3*							
	Boston, Mass.									7.40 *T8*				14.90 *T8*
	New Haven, Conn.									7.30 *D1*				
	Baltimore, Md.									6.85 *T8*				
	Phoenixville, Pa.					5.85 *P2*		5.85 *P2*						
	Sparrows Pt., Md.								4.675 *B3*		6.95 *B3*			
	Bridgeport, Wallingford, Conn.	$79.00 *N8*	$96.50 *N8*	$107.00 *N8*						7.30 *W1* 6.95 *N8*				
	Pawtucket, R. I. Worcester, Mass.									7.48 *A5,N7*				14.90 *N7*
MIDDLE WEST	Alton, Ill.								4.875 *L1*					
	Ashland, Ky.								4.675 *A7*					
	Canton-Massillon, Dover, Ohio		$94.00 *R3*	$107.00 *R3, T5*						6.85 *G4*		10.10 *G4*		14.55 *G4*
	Chicago, Ill. Franklin Park, Ill. Evanston, Ill.	$74.00 *U1, R3*	$91.50 *U1, R3,W8*	$107.00 *U1, R3,W8*	5.90 *U1*	5.00 *U1,W8* 5.00 *P13*	7.35 *U1,Y1* 6.00 *W8*	5.00 *U1*	4.675 *N4* 4.675 *A1*	6.95 *A1,T8* 6.95 *M8*			7.75 *W8, S9*	14.55 *A1, S9,T8*
	Cleveland, Ohio									6.85 *A5,J3*			7.75 *J3*	
	Detroit, Mich.			$107.00 *R5*					4.775 *G3, M2*	6.95 *M2,G3, D2,P11*	7.05 *G3*	10.10 *G3, D2*	7.75 *G3*	
	Anderson, Ind.									6.85 *G4*		10.10 *G4*		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	$74.00 *U1*	$91.50 *U1*	$107.00 *U1, Y1*	5.90 *I3*	5.00 *U1*	7.35 *U1,I3*	5.25 *I3*	4.675 *U1, I3,Y1*	6.85 *Y1*	6.95 *U1, I3,Y1*	10.20 *Y1*	7.75 *U1, Y1*	
	Sterling, Ill.	$74.00 *N4*				5.00 *N4*			4.775 *N4*					
	Indianapolis, Ind.									7.00 *C5*				
	Newport, Ky.												7.75 *A9*	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		$91.50 *S1, C10*	$107.00 *S1, C10*					4.675 *S1, R3*	6.85 *T4*	6.95 *S1, R3*	10.00 *S1, R3*	7.75 *S1*	14.55 *S1*
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	$74.00 *U1*	$91.50 *U1, C11*	$107.00 *U1, C11*	5.90 *U1*	5.00 *U1, J3*	7.35 *U1, J3*	5.00 *U1*	4.675 *P6*	5.750 *P6* 6.85 *J3,B4, S7*			7.75 *S9*	14.55 *S9*
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 *W3*			4.675 *W3*	6.85 *W3,F3*	6.95 *W3*	9.65 *W3*		
	Youngstown, Ohio	$74.00 *R3*	$91.50 *Y1, C10*	$107.00 *Y1*			7.35 *Y1*		4.675 *U1, Y1*	6.85 *Y1,C5*	6.95 *U1, Y1*	10.20 *Y1*	7.75 *U1, Y1*	
WEST	Fontana, Cal.	$83.50 *K1*	$101.00 *K1*	$128.00 *K1*		5.75 *K1*	8.10 *K1*	5.90 *K1*	5.525 *K1*	8.70 *K1*				
	Geneva, Utah		$91.50 *C7*			5.00 *C7*	7.35 *C7*							
	Kansas City, Mo.					5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			
	Los Angeles, Torrance, Cal.		$101.00 *B2*	$127.00 *B2*		5.70 *C7, B2*	8.05 *B2*		5.425 *B2, C7*	8.90 *C1*			8.95 *B2*	
	Minnequa, Colo.					5.30 *C6*			5.775 *C6*					
	Portland, Ore.					5.75 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$101.00 *B2*			5.65 *B2*	8.00 *B2*		5.425 *C7,B2*					
	Seattle, Wash.		$105.00 *B2*			5.75 *B2*	8.10 *B2*		5.675 *B2*					
SOUTH	Atlanta, Ga.					5.20 *A8*			4.875 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$74.00 *T2*	$91.50 *T2*			5.00 *T2,R3* 5.25 *C16*	7.35 *T2*		4.675 *T2,R3* 4.975 *C10* 4.925 *C16*		6.95 *T2*			
	Houston, Lone Star, Texas	$80.00 *L3*	$96.50 *S2*	$112.00 *S2*		5.10 *S2*	7.45 *S2*		4.925 *S2*		7.20 *S2*			

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		SHEETS									WIRE ROD	TINPLATE†		BLACK PLATE
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot-rolled *19* ga.		Cokes* *1.25*-lb. base box	Electro* *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Bethlehem, Pa.											† Special coated mfg. terne deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct $2.20 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Buffalo, N. Y.	4.675 *B3*	5.75 *B3*				6.90 *B3*	8.525 *B3*			5.80 *W6*			
	Claymont, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.725 *A2*	5.80 *A2*				6.95 *A2*							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.80 *B3*			
	Fairless, Pa.	4.725 *U1*	5.80 *U1*				6.95 *U1*	8.575 *U1*				$9.80 *U1*	$8.50 *U1*	
	New Haven, Conn.													
	Phoenixville, Pa.													
	Sparrows Pt., Md.	4.675 *B3*	5.75 *B3*	6.30 *B3*			6.90 *B3*	8.575 *B3*	9.275 *B3*		5.90 *B3*	$9.80 *B3*	$8.50 *B3*	
	Worcester, Mass.										6.10 *A5*			
	Trenton, N. J.													
MIDDLE WEST	Alton, Ill.										6.00 *L1*			
	Ashland, Ky.	4.675 *A7*		6.30 *A7*	6.325 *A7*									
	Canton-Massillon, Dover, Ohio			6.30 *R3,R1*										
	Chicago, Joliet, Ill.	4.675 *W8, A1*					6.90 *U1*			5.80 *K2*	5.80 *A5,R3, N4,W8,K2*			
	Sterling, Ill.										5.90 *N4, K2*			
	Cleveland, Ohio	4.675 *J3, R3*	5.75 *J3, R3*		6.325 *R3*		6.90 *R3*	8.525 *R3, J3*			5.80 *A5*			
	Detroit, Mich.	4.775 *G3, M2*	5.85 *G3* 5.75 *M2*				7.00 *G3*	8.625 *G3*						
	Newport, Ky.	4.675 *A9*	5.75 *A9*											
	Gary, Ind. Harbor, Indiana	4.675 *U1, I3,Y1*	5.75 *U1, I3,Y1*	6.30 *U1, I3*	6.325 *U1, I3,Y1*	6.70 *U1*	6.90 *U1, Y1,I3*	8.525 *U1, Y1*			5.80 *Y1*	$9.70 *U1, Y1*	$8.40 *I3, U1,Y1*	7.15 *U1, Y1*
	Granite City, Ill.	4.675 *G2*	5.95 *G2*	6.50 *G2*	6.525 *G2*								$8.50 *G2*	7.25 *G2*
	Kokomo, Ind.			6.40 *C9*							5.90 *C9*			
	Mansfield, Ohio		5.75 *E2*			6.70 *E2*								
	Middletown, Ohio		5.75 *A7*	6.30 *A7*	6.325 *A7*	6.70 *A7*								
	Niles, Warren, Ohio Sharon, Pa.	4.675 *S1, R3,N3*	5.75 *R3*	6.30 *R3*	6.325 *N3*	6.70 *N3*	6.90 *S1, R3*	8.525 *S1, R3*					$8.40 *R3*	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 *U1, J3,P6*	5.75 *U1, J3,P6*	6.30 *U1, J3*	6.325 *U1*		6.90 *U1, J3,R3*	8.525 *U1, J3*	9.275 *U1*		5.80 *A5, P6,J3*	$9.70 *J3, U1*	$8.40 *U1, J3*	7.15 *U1, J3*
	Portsmouth, Ohio	4.675 *P7*	5.75 *P7*								5.80 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	4.675 *W3, W5*	5.75 *W3, W5,F3*	6.30 *W3, W5*		6.70 *W3, W5*	6.90 *W3*	8.525 *W3*				$9.70 *W5, W3*	$8.40 *W5, W3*	7.15 *W5* 7.40 *W3*
	Youngstown, Ohio	4.675 *U1, Y1*	5.75 *Y1*		6.325 *Y1*		6.90 *Y1*	8.525 *Y1*			5.80 *Y1*			7.15 *Y1*
WEST	Fontana, Cal.	5.525 *K1*	7.00 *K1*				7.75 *K1*	9.775 *K1*				$10.45 *K1*	$9.15 *K1*	
	Geneva, Utah	4.775 *C7*												
	Kansas City, Mo.										6.05 *S2*			
	Los Angeles, Torrance, Cal.										6.60 *B2*			
	Minnequa, Colo.										6.05 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.375 *C7*	6.70 *C7*	7.05 *C7*							6.60 *C7*	$10.45 *C7*	$9.15 *C7*	
	Seattle, Wash.													
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.675 *T2, R3*	5.75 *T2*	6.30 *T2, R3*							5.80 *T2,R3*	$9.80 *T2*	$8.50 *T2*	
	Houston, Tex.										6.05 *S2*			

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		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.125 *B3*	8.325 *B3*	7.40 *B3*					
	Buffalo, N. Y.	5.075 *B3,R3*	5.075 *B3,R3*	6.90 *B5*	6.125 *B3,R3*	8.325 *B5,B3*	7.40 *B3*	4.85 *B3*				7.20 *W6*
	Claymont, Del.							5.70 *C4*		6.85 *C4*	7.55 *C4*	
	Coatesville, Pa.							5.25 *L4*		6.85 *L4*	7.55 *L4*	
	Conshohocken, Pa.							4.95 *A2*	5.925 *A2*	6.85 *A2*	7.25 *A2*	
	Harrisburg, Pa.							5.80 *P2*	6.275 *P2*			
	Hartford, Conn.			7.35 *R3*		8.625 *R3*	7.40 *B3*					
	Johnstown, Pa.	5.075 *B3*	5.075 *B3*		6.125 *B3*			4.85 *B3*		6.85 *B3*	7.25 *B3*	7.20 *B3*
	Fairless, Pa.	5.225 *U1*	5.225 *U1*		6.275 *U1*							
	Newark, N. J.			7.30 *W10*		8.50 *W10*						
	Camden, N. J.			7.30 *P10*		8.50 *P10*						
	Bridgeport, Conn. Putnam, Conn.	5.30 *N8*	5.30 *N8*	7.20 *N8* 7.40 *W10*	6.20 *N8*	8.475 *N8*	7.50 *N8*					
	Sparrows Pt., Md.		5.075 *B3*					4.85 *B3*		6.85 *B3*	6.85 *B3*	7.30 *B3*
	Palmer, Worcester, Readville, Mass. Milton, Pa.	5.225 *M7*	5.225 *M7*	7.40 *B5,C14*		8.625 *A5* 8.625 *B5*						7.50 *A5,W6* 9.025 *T8*
	Spring City, Pa.			7.30 *K4*		8.50 *K4*						
MIDDLE WEST	Alton, Ill.	5.275 *L1*										7.40 *L1*
	Ashland, Newport, Ky.							4.85 *A7,A9*		6.85 *A9*		
	Canton, Massillon, Ohio			6.85 *R3,R2*	6.125 *R3,T5*	8.325 *R3,R2,T5*						
	Chicago, Joliet, Ill.	5.075 *U1,R3, W8,N4* 5.075 *P13*	5.075 *U1,R3, N4* 5.075 *P13*	6.85 *A5,B5, W10,L2 W8,N9*	6.125 *U1,R3, W8*	8.325 *A5,B5, W8,L2,N9, W10*	5.875 *W8* 7.425 *U1*	4.85 *U1,I3, W8,A1*	5.925 *U1*	6.85 *U1,W8*	7.25 *U1*	7.20 *A5,K2 R3,N6,W7*
	Cleveland, Ohio	5.075 *R3*	5.075 *R3*	6.85 *A5,C13*		8.325 *A5,C13*	7.425 *R3*	4.95 *J3,R3*	5.925 *J3*		7.25 *J3,R3*	7.20 *A5, C13*
	Detroit, Mich.	5.175 *G3*	5.425 *G3*	7.05 *B5,P8* 7.10 *P3* 6.85 *R5*	6.225 *G3* 6.125 *R5*	8.525 *B5,P3, P8* 8.325 *R5*	7.525 *G3*	4.95 *G3*		6.90 *G3*		
	Duluth, Minn.											7.20 *A5*
	Gary, Ind. Harbor, Crawfordsville	5.075 *U1,I3, Y1*	5.075 *U1,I3, Y1*	6.85 *R3,M5*	6.125 *U1,I3, Y1*	8.325 *R3,M4*	7.425 *U1,I3, Y1*	4.85 *U1,I3, Y1*	5.925 *I3*	6.85 *U1,Y1*	7.25 *U1,Y1*	7.30 *M4*
	Granite City, Ill.							5.05 *G2*				
	Kokomo, Ind.											7.30 *C9*
	Sterling, Ill.	5.175 *N4*	5.175 *N4*					4.85 *N4*				7.30 *K2*
	Niles, Warren, Ohio Sharon, Pa.			6.85 *C10*	6.125 *C10,S1*	8.325 *C10*	7.425 *S1*	4.85 *S1,R3*		6.85 *S1*	7.25 *S1,R3*	
	Pittsburgh, Pa. Midland, Pa.	5.075 *U1, C11,J3*	5.075 *U1,J3*	6.85 *A5,C8, J3,R3,S9 B4,W10,C11*	6.125 *U1, C11,J3*	8.325 *A5,R3, S9,C8,W10, C11*	7.425 *U1,J3*	4.85 *U1,J3*	5.925 *U1*	6.85 *U1,J3*	7.25 *U1,J3*	7.20 *A5,J3, P6*
	Portsmouth, Ohio											7.20 *P7*
	Wairton, Wheeling, Follansbee, W. Va.							4.85 *W5*				
	Youngstown, Ohio	5.075 *U1, Y1,R3*	5.075 *U1, Y1,R3*	6.85 *U1,Y1, F2*	6.125 *U1,Y1*	8.325 *Y1,F2*	7.425 *U1,Y1,*	4.85 *U1,Y1, R3*		6.85 *Y1*	7.25 *Y1* 7.25 *U1*	7.20 *Y1*
WEST	Emeryville, Cal.	5.825 *J5*	5.825 *J5*									
	Fontana, Cal.	5.775 *K1*	5.775 *K1*		7.175 *K1*		8.125 *K1*	5.60 *K1*		7.40 *K1*	8.00 *K1*	
	Geneva, Utah							4.85 *C7*			7.25 *C7*	
	Kansas City, Mo.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*					7.45 *S2*
	Los Angeles, Torrance, Cal.	5.775 *C7,B2*	5.775 *C7,B2*	8.30 *R3,P14*	7.175 *B2*	10.20 *P14*	8.125 *B2*					8.15 *B2*
	Minnequa, Colo.	5.525 *C6*	5.525 *C6*					5.70 *C6*				7.45 *C6*
	Portland, Ore.	5.825 *O2*	5.825 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	5.775 *C7* 5.825 *B2* 6.025 *P9*	5.775 *C7* 5.825 *B2* 6.025 *P9*				8.175 *B2*					8.15 *C7,C6*
	Seattle, Wash.	5.825 *B2 N6*	5.825 *B2*				8.175 *B2*	5.75 *B2*		7.75 *B2*	8.15 *B2*	
SOUTH	Atlanta, Ga.	5.275 *A8*	5.275 *A8*									7.40 *A8*
	Fairfield, Ala. City, Birmingham, Ala.	5.075 *T2,R3* 5.325 *C16*	5.075 *T2,R3* 5.325 *C16*	7.45 *C16*			7.425 *T2*	4.85 *T2,R3*			7.25 *T2*	7.20 *T2,R3*
	Houston, Ft. Worth, Lone Star, Tex.	5.325 *S2*	5.325 *S2*		6.375 *S2*		7.675 *S2*	4.95 *S2* 5.20 *L3*		6.95 *S2*	7.35 *S2*	7.45 *S2*

† Merchant Quality—Specialty Quality .35¢ higher.

STEEL PRICES *(Effective April 9, 1957)*

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland.
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.

D1 Detroit Steel Corp., Detroit
D2 Dearborn Div., Sharon Steel Corp.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.
G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.

R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½-3 In.		2 In.		2½ In.		3 In.		3½-4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Youngstown *R3*	9.25	+10.00	12.25	+6.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fontana *K1*	+3.75	+19.00	+0.75	+15.00	2.75	+10.50	5.25	+9.75	5.75	+8.75	6.25	+8.25	7.75	+8.50								
Pittsburgh *J3*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Alton, Ill. *L1*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Sharon *M3*	9.25	+10.00	12.25	+2.00	15.75	+1.50	18.25	0.25	18.75	1.25	19.25	1.75	20.75	2.50								
Fairless *N2*	7.25	+8.00	10.25	+4.00	13.75	0.50	16.25	1.25	16.75	2.25	17.25	2.75	18.75	2.50								
Pittsburgh *N1*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Wheeling *W5*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25								
Wheatland *W4*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25								
Youngstown *Y1*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
Indiana Harbor *Y1*	8.25	+9.00	13.25	+2.00	14.75	1.50	17.25	2.25	17.75	3.25	18.25	3.75	19.75	4.25								
Lorain *N2*	9.25	+6.00	12.25	+2.00	15.75	2.50	18.25	3.25	18.75	4.25	19.25	4.75	20.75	5.25	5.25	+20.25	1.25	+16.50	3.75	+13.00	5.25	+11.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Youngstown *R3*	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	5.75	22.75	5.50								
Fairless *N2*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Fontana *K1*	0.75		4.75		7.75		8.25		8.75		9.25		9.75									
Pittsburgh *J3*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Alton, Ill. *L1*	11.75	+2.00	15.75	2.00	18.75	6.50	19.25	5.25	19.75	6.25	20.25	6.75	20.75	5.50								
Sharon *M3*	13.75	+4.00	17.75	list	20.75	4.50	21.25	4.25	21.75	5.25	22.25	5.75	22.75	5.50								
Pittsburgh *N1*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Wheeling *W5*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Wheatland *W4*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50								
Youngstown *Y1*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50
Indiana Harbor *Y1*	12.75	+1.00	16.75	3.00	19.75	7.50	20.25	6.25	20.75	7.25	21.25	7.75	21.75	6.50								
Lorain *N2*	13.75	+2.00	17.75	4.00	20.75	8.50	21.25	7.25	21.75	8.25	22.25	8.75	22.75	7.50	3.75	+17.75	3.75	+12.00	6.25	+10.50	11.25	+5.50

Threads only, buttweld and seamless 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in. 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.68	T-1
18	4	1	—	5	2.385	T-4
18	4	2	—	—	1.185	T-2
1.5	4	1.5	8	—	1.04	M-1
6	4	2	6	—	1.43	M-3
6	4	2	5	—	1.185	M-2

High-carbon chromium.. .83 D-3, D-5
Oil hardened manganese .45 O-2
Special carbon ..... .41 W-1
Extra carbon ..... .345 W-1
Regular carbon ..... .29 W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*A3, J2, L4*) 10 pct	Plate (*A3, J2, L4*) 15 pct	Plate (*A3, J2, L4*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	35.50
	304	34.60	38.00	41.50	37.75
	316	38.70	43.20	46.65	55.50
	321	36.35	39.80	43.50	44.75
	347	39.50	43.95	48.45	54.25
	405	29.20	33.15	37.05	.....
	410, 430	28.70	32.65	36.55	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 39.85. 1 side, 33.00.

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	9.00	9.20	.....
Armature	10.35	10.35	10.85
Elect.	11.00	11.025	11.525
Meter	12.05	12.075	12.575
Dynamo	13.05	13.05	13.55
Trans. 72	14.05	14.05	14.55
Trans. 65	14.60	Grain Oriented	
Trans. 58	15.10	Trans. 80	18.50
Trans. 52	16.15	Trans. 73	19.00

Producing points: Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*N5*); Niles, O. (*N3*); Vandergrift (*U1*); Warren, O. (*R3*) (20¢ higher, HR); Zanesville, Butler (*A7*).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1957 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	167	181		195	187	8.10	8.50
Aliquippa, Pa. *J3***	164	179			181	8.20	8.875
Atlanta *A8***	166	182		192	190	8.05	8.65
Bartonville *K2***	166	182		198	190	8.30	9.06
Buffalo *W6*						8.20	8.75
Chicago, Ill. *N4***	164	180	167	196	188	8.35	9.10
Cleveland *A6*	173					8.20	8.75
Cleveland *A5*						8.20	
Crawfordsville *M4***	166	182		198	190	8.30	9.05
Donora, Pa. *A5*	164	176		196	184	8.20	8.75
Duluth *A5*	164	176	167	196	184	8.20	8.75
Fairfield, Ala. *T2*	164	176		196	184	8.20	8.75
Galveston *D4*	169‡						
Houston *S2*	169	181		195	189	8.45	9.00
Johnstown, Pa. *B3***	164	180	167		188	8.20	8.95
Joliet, Ill. *A5*	164	176		196	184	8.20	8.75
Kokomo, Ind. *C9**	166	178		198	186	8.30	8.85
Los Angeles *B2***						9.15	9.90
Kansas City *S2**	169	181		195	189	8.45	9.00
Minnequa *C6†*	169	181	172	195	189	8.45	9.00
Monessen *P6*	167	185			191	8.10	8.10
Palmer, Mass. *W6*						8.50	9.05
Pittsburg, Cal. *C7*	183	199		220	204	9.15	9.70
Rankin, Pa. *A5*	164	176			184	8.20	8.75
So. Chicago *R3*	167	181		195	187	8.10	8.50
S. San Francisco *C6†*				214		9.15	9.70
Sparrows Pt. *B3***	166			198	190	8.30	9.05
Struthers, O. *Y1**						7.95	8.45
Worcester *A5*	170					8.50	9.05
Williamsport, Pa. *S5*			175				

* Zinc less than .10¢. † Plus zinc extras.
** 13.5 zinc. ‡ Wholesalers only.
*** 10¢ zinc.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. *T8*	9.20	10.40	12.60	15.60	18.55
Bristol, Conn. *W12*		10.40	12.60	15.60	18.55
Boston *T8*	9.20	10.40	12.60	15.60	18.55
Buffalo, N. Y. *R7*	8.65	10.10	12.30	15.30	18.25
Carnegie, Pa. *S9*	8.65	10.10	12.30	15.30	
Cleveland *A5*	8.65	10.10	12.30	15.30	18.25
Detroit *D1*	8.75	10.20	12.40	15.40	.....
Detroit *D2*	8.75	10.20	12.40	.....	.....
Dover, O. *G4*	8.65	10.10	12.30	15.30	18.25
Evanston, Ill. *M8*	8.65	10.10	12.30	.....	.....
Franklin Park, Ill. *T8*	8.75	10.10	12.30	15.30	18.25
Harrison, N. J. *C11*	.....	.....	12.30	15.30	18.25
Indianapolis *C5*	8.10	9.95	12.60	15.60	17.95
Los Angeles	10.85	12.30	14.50	.....	.....
New Castle, Pa. *B4*	8.65	10.10	12.30	15.30	.....
New Haven, Conn. *D1*	9.10	10.40	12.60	15.60	.....
Pawtucket, R. I. *N7*	9.20	10.40	12.60	15.60	18.55
Pittsburgh *S7*	8.65	10.10	12.30	15.30	18.25
Riverdale, Ill. *A1*	8.75	10.10	12.30	15.30	18.25
Sharon, Pa. *S1*	8.65	10.10	12.30	15.30	18.25
Trenton *R4*	11.05	10.40	12.60	15.60	18.55
Wallingford *W1*	9.10	10.40	12.60	15.60	18.45
Warren, Ohio *T4*	8.65	10.10	12.30	15.30	18.25
Worcester, Mass. *A5*	9.20	10.40	12.60	15.60	18.55
Youngstown *C5*	7.95	9.80	12.60	15.00	17.95

BOILER TUBES

$ per 100 ft. carload lots, cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
Babcock & Wilcox	2	13	36.34	42.56	33.21	.....
	2½	12	48.94	57.31	44.73	.....
	3	12	56.51	66.18	51.66	.....
	3½	11	65.97	77.25	60.30	.....
	4	10	87.61	102.59	80.07	.....
National Tube	2	13	36.34	42.56	33.21	.....
	2½	12	48.94	57.31	44.73	.....
	3	12	56.51	66.18	51.66	.....
	3½	11	65.97	77.25	60.30	.....
	4	10	87.61	102.59	80.07	.....
Pittsburgh Steel	2	13	36.34	42.56	.....	.....
	2½	12	48.94	57.31	.....	.....
	3	12	56.51	66.18	.....	.....
	3½	11	65.97	77.25	.....	.....
	4	10	87.61	102.59	.....	.....

WAREHOUSES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery† Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Hot-Rolled (special quality)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.17	9.37	9.83	8.21	8.55	8.59	8.45	.....	10.23	.....	.....	.....	.....
Baltimore	$.10	7.79-7.98	8.99-9.08	9.12	8.27-8.46	8.12-8.36	8.57-8.85	8.34-8.53	.....	9.09-9.23	14.99	14.44	18.39	18.09
Birmingham	.15	7.68-7.80	8.88-9.00	9.52	7.78-7.82	8.01-8.16	8.05-8.20	8.07	8.44	10.04-10.12	.....	.....	.....	.....
Boston	.10	8.94	9.98	11.16	8.99	9.28	9.20	9.17	9.57	.....	15.79	14.79	19.14	18.39
Buffalo	.15	8.00	9.15	10.90	8.20	8.65	8.65	8.40	8.85	8.85	15.65	14.65	19.01	18.25
Chicago	.15	7.95	9.15	9.85	7.97	8.31	8.35	8.22	8.44-8.59	8.50	15.30	14.30	18.65	17.90
Cincinnati	.15	8.09	9.20	9.90	8.29	8.67	8.89	8.53	8.87	8.99	15.61	14.61	18.96	18.21
Cleveland	.15	7.93	9.13	9.75	8.07	8.54	8.72	8.31	8.67	8.75	15.39	14.39	18.74	17.99
Denver		9.55	11.09	12.41	9.70	9.80	9.60	9.75	.....	10.54	.....	.....	.....	19.79
Detroit	.15	8.18	9.40	10.20	8.32	8.66	8.89	8.52	8.86	8.85	15.46	14.56	18.81	18.16
Houston		8.80	9.75	.....	8.85	8.80	9.10	9.15	.....	10.65	15.50	.....	19.30	19.05
Kansas City	.20	8.52	9.72	10.07	8.60	8.83	8.87	8.73	.....	9.42	15.32	14.77	18.72	18.42
Los Angeles	.10	9.20	10.90	11.75	9.25	9.75	9.25	9.15	9.30	12.20	16.45	15.60	20.30	19.70
Memphis	.15	8.02	9.22	.....	8.12	8.35	8.39	8.25	.....	9.85	.....	.....	.....	.....
Milwaukee	.15	8.08	9.28	9.98	8.10	9.75	8.56	8.35	8.71	8.72	15.43	14.43	18.78	18.03
New York	.10	8.55	9.76	10.33	9.00	9.11	9.01	9.11	9.48	.....	15.02	14.69	18.42	18.29
Norfolk	.20	8.00	.....	.....	8.40	8.35	8.70	8.45	.....	10.70	.....	.....	.....	.....
Philadelphia	.10	8.25	9.17	10.39	8.92	8.78	8.80	8.81	9.18	9.41	15.61	14.61	18.96	18.21
Pittsburgh	.15	7.93	9.14	10.20	8.07	8.31	8.35	8.22	8.59	8.75	15.30	14.30	18.65	17.90
Portland		8.90	9.65	11.40	10.25-11.05	9.00	9.35	9.45	.....	13.55	16.70	16.10	20.40	20.25
San Francisco	.10	9.05	10.40	10.90	9.05	9.30	9.15	9.15	9.90	12.40	16.45	15.60	20.30	19.70
Seattle		9.55	10.70	11.65	9.55	9.30	9.35	9.50	9.85	13.40	16.55	15.85	19.50	19.45
Spokane	.15	9.70	10.85	11.80	9.70	9.45	9.50	9.65	10.00	13.55	.....	16.75	.....	20.35
St. Louis	.15	8.29	9.49	10.21	8.34	8.67	8.82	8.58	8.96	9.11	15.66	14.66	19.01	18.26
St. Paul	.15	8.29	9.64	10.31	8.39-8.58	8.71-9.05	8.75-9.09	8.52	.....	9.21	.....	14.62	.....	18.27

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets for quantity.
† 16 gage. †† 13½¢ zinc. ‡ Deduct for country delivery.

(Effective April 9, 1957)

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Untreated
Bessemer *U1*	5.275	6.25	6.60				
So. Chicago *R3*				9.225			
Ensley *T2*	5.275	6.25					
Fairfield *T2*		6.25		9.225		6.275	
Gary *U1*	5.275					6.275	
Huntington *C16*		6.25					
Ind. Harbor *I3*	5.275		6.60	9.225		6.275	
Ind. Harbor *Y1*				8.775			
Johnstown *B3*		6.25					
Joliet *U1*			6.60				
Kansas City *S2*				9.225			13.85
Lackawanna *B3*	5.275	6.25	6.60			6.275	
Lebanon *B3*							13.85
Minnequa *C6*	5.275	6.75	6.60	9.225		6.275	13.85
Pittsburgh *P5*				8.775	12.85		
Pittsburgh *J3*				9.225			
Seattle *B2*				9.725		6.425	13.16
Steelton *B3*	5.275		6.60			6.275	13.85
Struthers *Y1*				8.775			
Torrance *C7*						6.425	
Williamsport *S5*		6.15					
Youngstown *R3*				9.225			

COKE

Furnace, beehive (f.o.b. oven) Net Ton
Connellsville, Pa. ..... $15.00 to $15.75
Foundry, beehive (f.o.b. oven)
$17.50 to $19.00
Foundry oven coke
Buffalo, del'd $31.75
Detroit, f.o.b. 30.50
New England, del'd 31.55
Kearney, N. J., f.o.b. 29.75
Philadelphia, f.o.b. 29.50
Swedeland, Pa., f.o.b. 29.50
Painesville, Ohio, f.o.b. 30.50
Erie, Pa., f.o.b. 30.50
Cleveland, del'd 32.65
Cincinnati, del'd 31.84
St. Paul, f.o.b. 29.75
St. Louis, f.o.b. 31.50
Birmingham, f.o.b. 28.85
Milwaukee, f.o.b. 30.50
Neville, Is., Pa. 29.25

ELECTRODES

Cents per lb, f.o.b. plant, threaded, with nipples, unbored

GRAPHITE			CARBON*		
Diam. (In.)	Length (In.)	Price	Diam. (In.)	Length (In.)	Price
24	84	24.75	40	100,110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
10	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.30
3	40	35.25			
2½	30	37.25			
2	24	57.75			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, 1rt allowed in quantity)

Copper
Cast elliptical, 18 in. or longer, 5000 lb lots 49.42
Electrodeposited 39.25
Brass, 80-20, ball anodes, 2000 lb or more 50.00
Zinc, ball anodes, 2000 lb lots 21.25
(For elliptical add 2¢ per lb)
Nickel, 99 pct plus, rolled carbon, 5000 lb $1.0225
(Rolled depolarized add 3¢ per lb)
Cadmium $1.70
Tin, ball anodes and elliptical $1.07 per in.

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum 76.00
Copper sulphate, 100 lb bags, per cwt. 24.35
Nickel salts, single, 100 lb bags ... 40.50
Nickel chloride, freight allowed, 300 lb 45.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums 23.05
(Philadelphia price 23.30)
Zinc cyanide, 100 to 900 lb 55.55
Potassium cyanide, 100 lb drum N. Y. 48.00
Chromic acid, flake typ., 1 to 20 100-499 lb drums 31.75

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)
Pct Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
½" and smaller x 6" and shorter	52½	56½	58½	59½
⅞" thru 1" x longer than 6"	43½	47½	50	51½
Rolled thread carriage bolts ½ in. & smaller x 6 in. and shorter	52½	56½	58½	59½
Lag, all diam. x 6" & shorter	52½	56	58	59
Lag, all diam. longer than 6 in.	44½	48	50	51
Plow bolts, ½" and smaller x 6" and shorter	52	55½	57	58

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.

	Full Case or Keg Price
¾ in. or smaller	61½
⅞ in. to 1 in. inclusive	57½
1⅛ in. to 1½ in. inclusive	62½
1⅝ in. and larger	56

C. P. Hex reg. & hvy.

¾ in. and smaller	61½
⅞ in. to 1½ in. inclusive	57½
1⅝ in. and larger	56

Hot Galv. Nuts (All Types)

¾ in. and smaller 48

Semi-finished Hex Nuts

¾ in. or smaller	61½
⅞ in. to 1½ in. inclusive	57½
1⅝ in. and larger	56

(Add 25 pct for broken case or keg quantities)

Finished

1 in. and smaller 64

Rivets

Base per 100 lb
½ in. and larger $11.50
Pct Off List
7/16 in. and smaller 23

Cap Screws

Discount (Packages)

	Bright Treated	H. C. Heat
New std. hex head, packaged		
⅝" diam. and smaller x 6" and shorter	44	31
¾", ⅞" and 1" diam. x 6" and shorter	27	9
⅝" diam. and smaller x longer than 6"	14	+ 6
¾", ⅞" and 1" diam. & longer than 6"	½	+24

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	44	61
¾" through 1" dia. x 6" and shorter	27	49

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 1/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

Plain Finish	Discount Mach. Screws	Stove Bolts
Cartons	19	32
Bulk *Quantity*		
To ¾" diam. incl.	25,000-200,000	9	54
5/16 to ½" diam. incl.	15,000-100,000	9	54
All diam. over 3" long	5,000-100,000	—	54

Machine Screw & Stove Bolt Nuts

	Discount Hex	Discount Square
In cartons	16	19
Quantity		
In Bulk ⅝" diam. & smaller	15,000-100,000	7	9

CAST IRON WATER PIPE INDEX

Birmingham 119.0
New York 131.7
Chicago 134.1
San Francisco-L. A. 141.8
Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5.00) $128.00
No. 1 Ohio 128.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 114.00
No. 2 Ohio 98.00
Ground fire clay, net ton, bulk (exc pt Salina, Pa., add $2.00) 20.00

Silica Brick

Mt. Union, Pa., Ensley, Ala. $140.00
Childs, Hays, Pa. 145.00
Chicago District 150.00
Western Utah 144.00-165.00
California 170.00
Super Duty
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville 150.00-157.00
Silica cement, net ton, bulk, Latrobe 26.50
Silica cement, net ton, bulk, Chicago 24.00
Silica cement, net ton, bulk, Ensley, Ala. 25.50
Silica cement, net ton, bulk, Mt. Union 23.00
Silica cement, net ton, bulk, Utah and Calif. 35.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt., $98.00
Standards chemically bonded, Curtner, Calif. 108.00
Burned, Balt. 92.00

Magnesite Brick

Standard, Baltimore $121.00
Chemically bonded, Baltimore 109.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk, $69.40
Domestic, f.o.b. Chewalah, Wash., Luning, Nev.
in bulk 43.00
in sacks 49.00

Dead Burned Dolomite

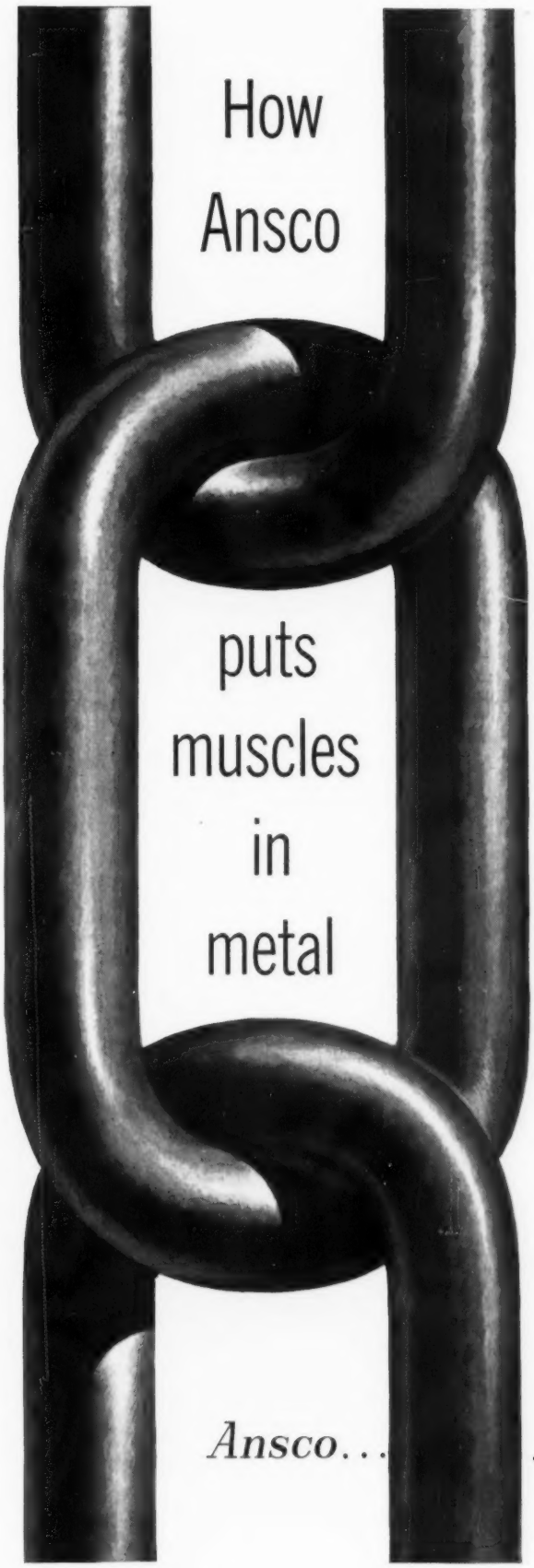
Per net ton

F.o.b. bulk, producing points in:
Pa., W. Va., Ohio $16.00
Midwest 16.35
Missouri Valley 15.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh

Swedish sponge iron f.o.b. Riverton, N. J., ocean bags 8.50¢
Canadian sponge iron, Del'd in East, carloads ... 9.5¢
Domestic sponge iron, 98+% Fe, carload lots ..... 8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe ..... 27.5¢
domestic 99.5+% Fe ..... 36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe 57.0¢
Electrolytic iron melting stock, 99.84% pure ..... 22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 99.8+% Fe..86.0¢ to $1.55
Aluminum, freight allowed.. 38.00¢
Brass, 10 ton lots ..... 37.50¢ to 50.00¢
Copper, electrolytic ..... 49.75¢
Copper, reduced ..... 49.75¢
Cadmium, 100-199 lb, 95¢ plus metal value
Chromium, electrolytic, 99.85% min. Fe .03 max. Del'd ... $5.00
Lead ..... 8.90¢ plus metal value
Manganese f.o.b. Exton, Pa.. 46.0¢
Molybdenum, 99% ..... $3.60 to $3.95
Nickel, unannealed $1.00
Nickel, annealed $1.06
Nickel, spherical, unannealed #80 ..... $1.13
Silicon ..... 43.50¢
Solder powder..7.0¢ to 9.0¢ plus met. value
Stainless steel, 302 ..... 99.0¢
Stainless steel, 316 ..... $1.32
Tin ..... 14.00¢ plus metal value
Tungsten, 99% (65 mesh) $4.00 (nominal)
Zinc, 10 ton lots ..... 18.75¢ to 32.50¢



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FERROALLOY PRICES

(Effective April 8, 1957)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, .30-1.00% max. Si.

0.02% C	41.50	0.20% C	38.50
0.03% C	41.00	0.50% C	38.25
0.06% C	39.50	1.00% C	37.50
0.10% C	39.00	1.50% C	37.35
0.15% C	38.75	2.00% C	37.25

4.00-4.50% C, 67.70% Cr, 1-2% Si.. 27.75
3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.75
0.025% C (Simplex) 34.75
0.10% C, 50-52% Cr, 2% max Si .. 35.50
8.50% max. C, 50-55% Cr, 3-6% Si 24.00
8.50% C, 50-55% Cr, 3% max. Si... 24.00

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.

0.10% max. C	$1.31
0.50% max. C	1.31
9 to 11% C, 88-91% Cr, 0.75% Fe	1.40

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (⅜" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.

Carloads	44.65
Ton lots	48.95
Less ton lots	51.45

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.
30-33% Ca, 60-65% Si, 3.00 max. Fe.

Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Maganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads	24.25
Ton lots	26.15
Less ton lots	27.15

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 1⅜ mesh

Ton lots	20.15
Less ton lots	21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr, 17-19% Si, 8-11% Mn, packed

Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	12.75
Johnstown, Pa.	12.75
Sheridan, Pa.	12.75
Philo, Ohio	12.75
S. Duquesne	12.75

Add or subtract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	14.80
Ton lots packed	17.20

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

Manganese	Silicon	
16 to 19%	3% max.	$100.50
19 to 21%	3% max.	102.50
21 to 23%	3% max.	105.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads	34.00
Ton lots	36.00
250 to 1999 lb	38.00
Premium for Hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn ... 25.50

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-90%.

	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	33.60	36.40	37.40
0.30% max. C	32.10	34.90	36.10
0.50% max. C	31.60	34.40	35.60
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	28.60	31.40	32.60

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.

Carloads bulk	12.80
Ton lots	14.45
Briquet contract basis carloads, bulk, delivered, per lb of briquet	14.10
Ton lots, packed	16.50

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.

	Ton lots, packed	Carloads, packed
96.75% Si, 1.25% Fe	23.70	22.40
98% Si, 0.75% Fe	24.45	23.15

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	7.70
Ton lots, packed	10.50

Electric Ferrosilicon

Contract prices, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	13.00	75% Si	16.80
65% Si	15.65	85% Si	18.50
		90% Si	19.90

Ferrovanadium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.

Openhearth	3.30
Crucible	3.30
High speed steel (Primos)	3.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
Less ton lots	2.40	3.30	4.55

Alsifer, 20% Al, 40% Si, 40% Fe. Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound Contained Mo $1.28

Ferrocolumbium, 50-50%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	$5.10
Less ton lots	5.15

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd ton lots, 2-in. x D per lb con't Sb plus Ta..... $4.25

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth Pa., per pound contained Mo.. $1.68

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $4.00 unitage, per gross ton..... $90.00
10 tons to less carload..... $110.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb. contained Ti..... $1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti..... $1.50
Less ton lots $1.54

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton $240.00

Ferrotungsten, ¼ x down, packed, per pounds contained W, ton lots delivered..... $2.95 (nominal)

Molybdic oxide, briquets, per lb contained Mo, f.o.b. Langeloth, Pa. $1.41
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.33

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 contract, basis, per pound contained V_2O_5 ..... $1.38

Zirconium contract basis, per lb of alloy
35-40% f.o.b. freight allowed, carloads, packed ..... 27.25¢
12-15%, del'd lump, bulk-carloads ..... 9.25¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload..... $5.50

Bortam, f.o.b. Niagara Falls,
Ton lots per pound..... 45¢
Less ton lots, per pound.... 50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound..... 14.00¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots.... 1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B ..... .85
14 to 19% 1.20
19% min. B 1.50

Granal, f.o.b. Bridgeville, Pa., freight, allowed, 100 lb and over
No. 1 ..... $1.05
No. 79 ..... 50¢

Manganese - Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd.
Ton lots $1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots..... $2.15

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Military Favoring Auction Sales

Used machine tools bring good prices when auctioned off, the Army, Navy and Air Force have discovered.

So they're stressing this method of surplus disposal.

▪ A lot of surplus military items are going on the block at auction sales these days. And much more of this excess property will be auctioned to civilian buyers later this year.

Returns from sales held so far have encouraged the U. S. Air Force to set up about eight more for the next few months. The Navy has just held auctions at Philadelphia and at Long Beach, Calif., where items with a total value figured at $3.6 million were offered.

Proved by Test—Some surplus materials sell particularly well via the auction route. The Air Force found this true in test sales at four bases. It was no surprise that vehicles brought a higher return than by the sealed-bid method. But hand tools also brought a better price—and that was surprising.

Results of Navy auctions show that machine tools, motion picture equipment, some electronics items, and electrical and navigational gear, go under the gavel at excellent prices. Auction methods will be stressed in material disposal.

Army practice is to let local property disposal officers select the most suitable means of selling their surplus stocks. However, the top-level logistics men realize some types of Army surplus can be sold for more through auctions. They'll push such sales in areas that look promising.

The Price is Right—Like the Navy, the Army finds lathes and other machine tools auction at excellent prices. Sealed bids are found to be best for ferrous scrap, and spot bids are most effective for items like dump trucks.

Despite efforts to keep down the volume of surplus, the Army says it sometimes has more than $1 million worth on hand at one site. Then the professional auctioneers are called in to handle the sale.

Congress is watching the results of military auctions because of the opportunities for better returns. With this in mind, the Army, Navy, and Air Force have an annual property disposal conference set for April 9-11, in Chicago. Improvements in selling techniques of all types will be discussed there.

Auction Puzzle — Used machinery dealers, on their part, are baffled by the high prices equipment brings at auctions.

One dealer, pointing out how the "auction craze" continues to force prices higher and higher, declares, "Buyers insist on paying top prices at auctions with no regard to terms, guarantees or condition of the equipment." If the supply of used machinery was limited, such an attitude might be understandable, he points out. However, with the exception of a few large items of equipment and the lack of a few really late model machine tools, there's no scarcity of equipment.

Yet, faced with users anxious to get equipment at any price, many dealers are becoming only spectators at sales. They also wonder why buyers are so reckless about price at auction sales, yet so price-conscious with dealers.

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3 ton P&H — 56' Span 220/3/60
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With 10 ton Auxiliary
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60 ton Henry & Wright, Roll Feed, Scrap Cutter 4" Stroke NEW 1950
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10,000# Aetna Standard, Length of Draw 41', Used to draw S.A.E. 1025 Welded Steel Tubing
FORGING MACHINES
1" to 5" Acme, Ajax, National
2" Acme Model XN, Air Clutch, NEW 1954
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100 ton Hydr. Stretcher Leveler. Capy. .032" Ga. 56" Width, 96" Length; 4 sheets in a Pack
LEVELERS—ROLLER
37" Torrington, 17 Rolls 1-31/32" Dia. Backed up
48" Aetna Standard, 17 Rolls 3¾" Dia.
54" McKay, 17 Rolls, 3¾" Dia.
108" American, 17 Rolls, 4½" Dia.

PLANER—PLATE EDGE
35" Southwark Pneumatic Holddown, Motor Driven, Capacity 1½"
PRESSES—HYDRAULIC
200 ton Bliss Hydro Dynamic, 36" Stroke Bed Area 30" x 31"
2800 ton Bliss Hydro Dynamic, 12" Stroke, 60-15/16" Between Columns
4500 Baldwin-Lima-Hamilton Hydr. Forging Press
PRESSES—STRAIGHT SIDE
Clearing F-1300-42, 300 ton, 24" Stroke, Bed 44 x 56"
Bliss #1018 Toggle Drawing 1550 ton, Strokes 24" and 12", Die Space 60" x 72"
PRESSES—TRIMMING
#56 Bliss Cons., 5" Stroke, 26" Bet. Ups
#73½ Bliss 3" Stroke, 18" Bet. Ups
#76½ Bliss 4" Stroke, 27" Bet. Ups
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12" x ½" Cincinnati
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36" Payson Slitting Line
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Liquidations—Bona Fide Auction Sales Arranged

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2000# Chambersburg Pneumatic Forging Hammer Late Type, Serial 20CH392L7.
2" Wallace Hydraulic Pipe Bender
6' Carlton Radial Drill, 17" column
No. 7 Ajax Forging Press, 700-ton capacity
3—2-ton Denison Auto. Hopper Feed & Index Table Hydr. Multipress
25 Transformer and Generating Arc Welders
2500 lb. Model E Chambersburg Steam Drop Hammer, New 1944
3000 lb. Model J-2 Chambersburg Board Drop Hammer, Motor driven head
1000 lb. Model J-2 Chambersburg Board Drop Hammer, Motor driven head
4" National High Duty Upsetting & Forging Machine, air clutch, also one with regular clutch, also 1", 2", 3" air clutch
Williams White Bulldozers from 5-ton to 300-ton
Landis Landmaco and other Landis Threading Machines
Single & Double End Punches
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1	1500	G.E.	514	250	4000/2300
2	1000	Whse.	720	250	2300
2	500	Whse.	1200	125/250	2300
1	300	G.E.	1200	250/275	2300
1	300 (3-unit)	Al. Ch.	1200	250/300	2300
3	200	Whse.	1200	125/250	2300
2	150	Rel.	1200	125	2200
2	150	Whse.	1200	125/250	2300
1	150	G.E.	1200	250	4600/2300
1	100	Al. Ch.	1200	250	4600/2300
1	100	Whse.	720	125/250	2200
1	75	Whse.	1200	125/250	2200

DIRECT CURRENT MOTORS
230-Volt

Qu.	H.P.	Make	Type	R.P.M.
2	600	Whse.	QM	110/220
1	400	G.E.	MPC	450
1	300	Whse.	Mill	300
2	275	Whse.	QM	425/850
1	200/250	El. Dy.	Ped. Brg.	400/1200
1	180	G.E.	MPC	400
1	175	G.E.	CD-175-A	850/1025
1	125	Whse.	8K-184	575/850
1	125	G.E.	MPC	400/1600
1	80	Rel.	651-T	575/1150
1	80	El. Dy.	25-S	525/1050
1	60/75	Whse.	SK-151	250/1000
1	50	Whse.	SK	500/1500
1	50	Whse.	SK-141	250/1000
2	30/40	Whse.	SK-143	500/1500
1	35	Whse.	SK	250/1000
1	32½	Whse.	SK-150	400/1200
1	25	Whse.	SK-121	200/1200
2	15	Whse.	SK-93	575/1725
3	5/7½	Rel.	T.E.F.C.	337/1350

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10" x 36" Landis type C hyd. pl. cylindrical, 1942.
45" No. 16A2 Blanchard automatic 2-spdl. late (2).
HAMMERS
No. 3C Chambersburg pneumatic, serial No. 2297.
No. 6-1 Nazel, pneumatic, late.
No. 6B Nazel, self-contained.
LATHES
No. 3 Gisholt Univ. Turret Lathe (2), 1942.
No. 5 Gisholt ram type Univ. Turret Lathe, 1940.
15" x 30" Lipe Carbo-Matic, 1942.
126" x 96' CC Niles Bemont Pond engine lathe, 80 HP, M.D.
MILLING MACHINES
No. 2 Brown & Sharpe vertical mill, new 1943.
No. 5-48 Cincinnati hydromatic duplex mill, serial 3B5IDIK-5.
No. 2-24 Cincinnati automatic simplex mill, serial No. 1B3PIT-1.
PRESSES
200 ton No. 7-72 Bliss S.S. D.C. Press Air Clutch.
350 ton Elmes self-cont. 4-post Hydraulic Press, 1944.
500 ton No. 1039 Hamilton D.C. adj. hed. 60"x102".
800 ton Model 2E-48-800 Hamilton, S.S. airelutch, new 1947.
SHAPERS & SLOTTERS
36 Rockford hyd. vertical slotter, new 1944.
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1½" National Upsetter, guided ram, hard ways.
3" Ajax upsetting & forging machine, air clutch, serial 3614.
3" National high duty forging machine, serial 14195.
3½" Ajax suspended slides, steel frame.
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7½" National Upsetter, air clutch, new 1944.
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1	1500	G.E.	MT	6600	1187
1	1100	F.M.	6VZK, B.B.	4800	1800
1	800	G.E.	MT	2300	293
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	500
1	500	Whse.	CW	550	350
1	400	Whse.	CW	440	514
1	350	Cr.Wh.	Size 71	208/416	1765
1	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	257
1	250	Cr. Wh.	Size 290	2300	350
1	250	Al. Ch.		550	600
1	200	G.E.	IE13 B-M	220/440	1760
1	200	G.E.	MT-557Y	220/440	1760
1	200	Cr. Wh.	20QB	440	505
1	200	G.E.	IM	440	435
3	200	G.E.	I-17AM	2200	435
1	200	G.E.	IM	2200	580
1	150 (unused)	Whse.	CW	2300	435
1	125	A.C.		440	865
1	125	Al. Ch.		440	720
1	100	G.E.	IM-16	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

SQUIRREL CAGE

1	800	G.E.	KT-573	2200	1180
1	650	G.E.	FT-559BY	440	8570
3	500	Whse.	CS-1216	2200	500
2	450	Whse.	CS-1420	2300/4150	354
1	400	G.E.	IK	2200	500
1	300	G.E.	KT-559A	2300	1775
1	200	G.E.	IK-17	440	580
2	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440	900/450
1	150	Whse.	CS8568	440	880
1	150	Whse.	CS	440	580

SYNCHRONOUS

Qu.	H.P.	Make	Types	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4350	C.W.	3501SL	4000/6900/13800	514
1	2850	Whse.	.Sp.f	2300/4600	514
1	2800	Whse.	.Sp.f.	2300	720
1	2000	Whse.		2300	120
2	1750	G.E.	ATI	2300	3600
1	735	G.E.	ATI	2200/12000	600
1	450	Whse.		2200	.28.5
1	325	G.E.	ATI	440	1800
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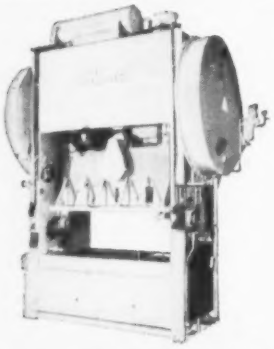

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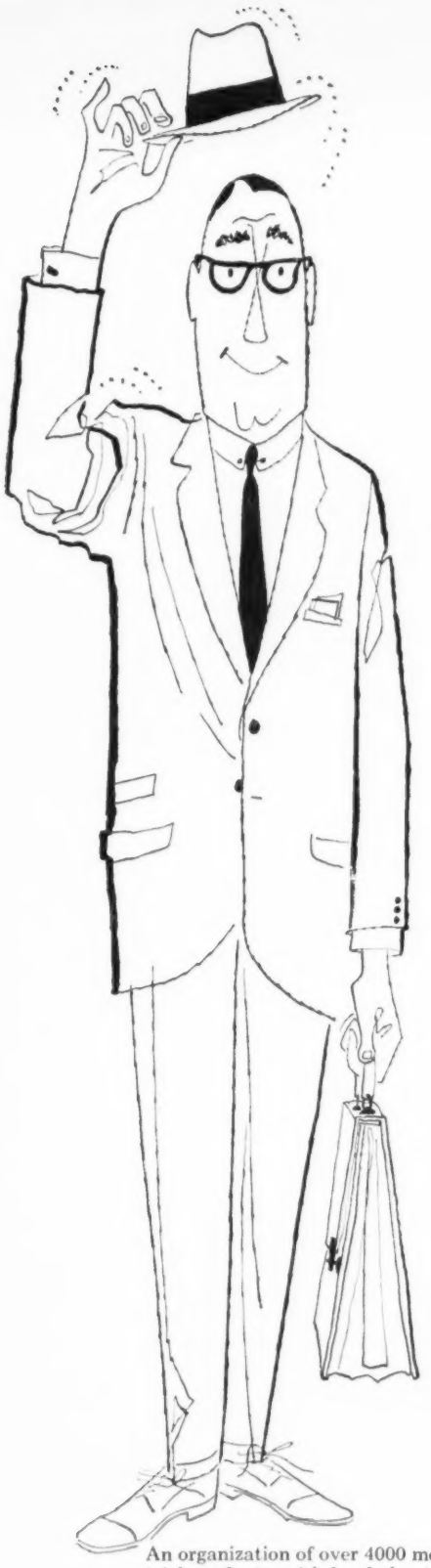

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METALWORKING BRIEFS

Kaiser Increases Expansion Plans

Kaiser Steel Corp. will increase its current $113 million expansion program by an additional $81 million. Entire program will boost Kaiser's ingot capacity from 1,536,000 tons to about 3 million tons. The $81 million will be used for new coke ovens, a second sinter plant, a fourth blast furnace, a third oxygen steelmaking furnace, two more soaking pits, plate mill expansion and improvement to firm's ore properties.

U. S. Steel Revises Tin Mill Pricing

Tin mill products produced by the operating divisions of U. S. Steel Corp. are going to be billed on the basis of prices in effect at the time of shipment, beginning next January 1st. The pricing method will replace the current system of making firm commitments for a six months period. Other producers will probably take similar action.

Reynolds OK's $60 Million Expansion

Reynolds Metals Co. will add to expansion plans for its facilities at Listerhill, Ala., at a cost of about $60 million. The new program will be superimposed over an existing three-year expansion plan announced in 1955. Cost of the two programs and an adjoining Ford Motor Co. aluminum foundry tied in with the venture is around $200 million.

Inland Sets Production Records

Inland Steel Co. set new production records for March and the first quarter at its Indiana Harbor Works. Plant's openhearths tapped more than 509,000 ingot tons in March, exceeding the previous record of 475,682 tons set in January. First quarter ingot production was above 1,411,000 tons, a gain over the previous high —1,383,000 tons in the final quarter of 1956.

Imports Drop Ferrocolumbium Price

Foreign imports of processed ferrocolumbium have forced domestic producers to drastically drop price of the product from $6.90 to $5.10 a lb.

U.S. Steel Orders Gas Turbine Blower

First gas turbine blowing system for supplying air in blast furnace operations will be built by Westinghouse Electric Corp. for U. S. Steel. Unit has been ordered for installation at U. S. Steel's South Works in Chicago.

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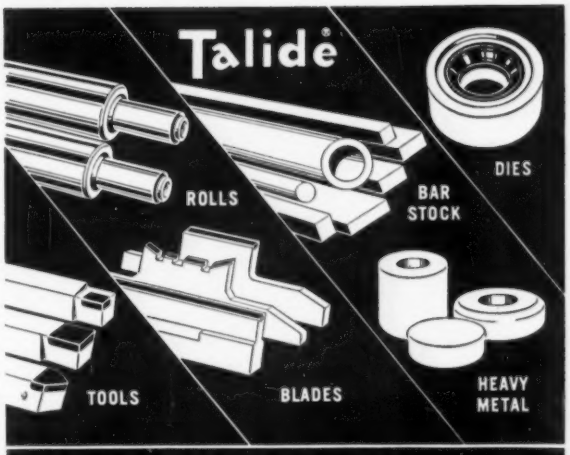

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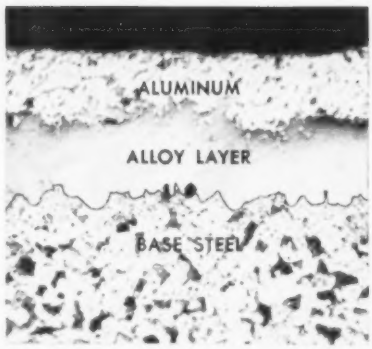

Section through Bethalume coating, showing aluminum overlay and iron-aluminum alloy layer.

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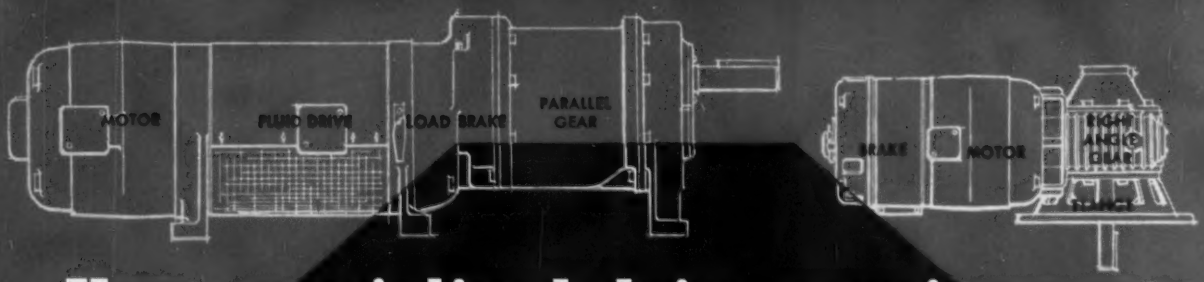

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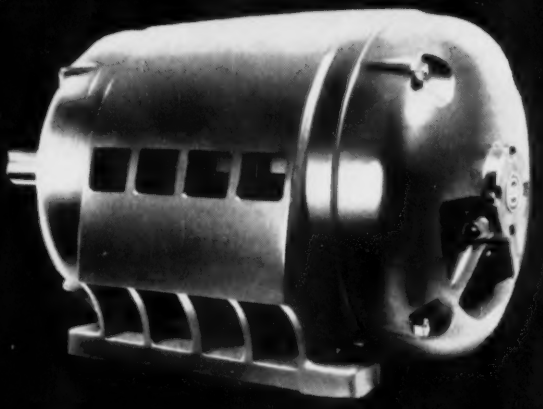

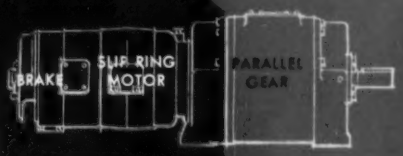

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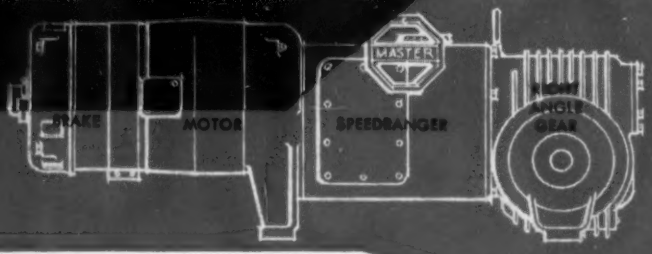

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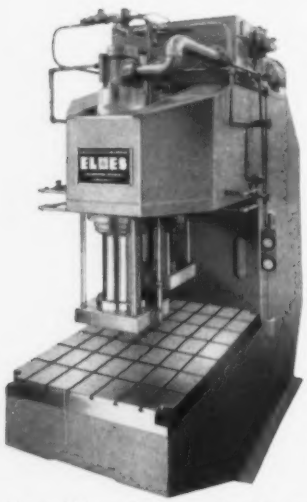

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